

Building Cost Manual





V



The Real Estate ANALYST

APPRAISAL BULLETIN

Volume XXIV

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Real Estate Economists, Appraisers and Counselors

RESIDENTIAL CONSTRUCTION COST DATA

THE problem of estimating construction costs by the cubic foot method is often complicated by different building designs. For example, a residence without a basement will have a higher cubic cost than another of the same area with a basement. Likewise, the newer types of houses with their low gables will have a higher cubic cost than will an older type of house (of the same quality) with high gables.

For the past several years we have published breakdowns of cubic foot costs by type of space. In these breakdowns we show the cost per cubic foot of roof space, living space, and basement space. The cubic content of the roof is figured from the top of the ceiling joists to the outer surface of the roof. The cubic content of the basement is figured from the bottom of the first floor joists to 6 inches beneath the basement floor. Therefore, the living space includes all volume lying between the bottom of the first floor joists and the top of the ceiling joists.

In computing the costs of the basement and attic space, only the structural portion has been considered. The cost of the plumbing, heating, and electrical systems is included in the cost of the living space, even though portions are actually located in the basement or attic.

The various unit cost figures in this bulletin may be substituted within certain limits. For example, suppose you were appraising a brick house of approximately the same size and shape as the six-room frame house. Instead of using 91.6¢ per cubic foot for the cost of the living space, you would substitute the cost of the living space in the six-room brick house, or \$1.005 per cubic foot. You would find, therefore, that the living space would cost \$14,850 and the total cost would be \$17,870, compared with \$16,570 for a frame house of the same size and shape.

In a slightly different manner, suppose you were appraising a brick veneer house of approximately the same size and shape as the brick ranch house. This is a small house of only 16,250 cubic feet, including a full basement. Moreover, it has a very small roof cubage. These two factors account for the high cubic foot cost of its living space (\$1.21). Because of the wide difference in size, it

CUBIC COSTS OF DIFFERENT TYPES OF SPACE



SIX-ROOM FRAME HOUSE

(Ground area 825 sq. ft.)

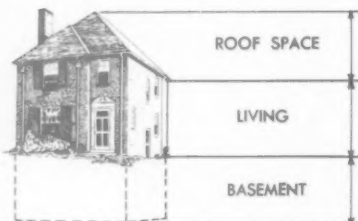
Type space	Cost	Volume	Cost per cu. ft.	% of total cost
Roof	\$ 1,050	3,300	31.8¢	6.3
Living	13,550	14,788	91.6	81.8
Basement	1,970	6,200	31.8	11.9
Total	\$16,570	24,288	68.2¢	100.0



FIVE-ROOM BRICK VENEER HOUSE

(Ground area 1,165 sq. ft.)

Type space	Cost	Volume	Cost per cu. ft.	% of total cost
Roof	\$ 1,825	5,003	36.5¢	12.1
Living	10,655	11,125	95.8	70.5
Basement	2,620	8,782	29.8	17.4
Total	\$15,100	24,910	60.6¢	100.0



SIX-ROOM BRICK HOUSE

(Ground area 751 sq. ft.)

Type space	Cost	Volume	Cost per cu. ft.	% of total cost
Roof	\$ 1,100	2,878	38.2¢	6.4
Living	14,300	14,222	100.5	82.6
Basement	1,900	6,000	31.7	11.0
Total	\$17,300	23,100	74.9¢	100.0



SIX-ROOM CALIFORNIA BUNGALOW

(Ground area 992 sq. ft.)

Type space	Cost	Volume	Cost per cu. ft.	% of total cost
Roof	\$ 850	2,480	34.3¢	9.0
Living	8,100	8,430	96.0	86.0
"Basement"	470	1,209	38.9	5.0
Total	\$ 9,420	12,119	77.7¢	100.0



BRICK BUNGALOW

(Ground area 1,190 sq. ft.)

Type space	Cost	Volume	Cost per cu. ft.	% of total cost
Roof	\$ 1,860	5,223	35.6¢	12.0
Living	11,000	11,050	99.5	71.0
Basement	2,630	9,100	28.9	17.0
Total	\$15,490	25,373	61.0¢	100.0



BRICK RANCH HOUSE

(Ground area 840 sq. ft.)

Type space	Cost	Volume	Cost per cu. ft.	% of total cost
Roof	\$ 840	2,520	33.3¢	7.5
Living	8,810	7,300	120.7	78.5
Basement	1,580	6,430	24.6	14.0
Total	\$11,230	16,250	69.1¢	100.0

CONSTRUCTION COST VARIATIONS IN 72 CITIES

PERCENTAGES ABOVE OR BELOW ST. LOUIS COST

Akron, Ohio	+2.8%	Los Angeles, Calif.	-10.5%
Albany, N. Y.	-2.5	Louisville, Ky.	-8.0
Allentown, Pa.	-1.0	Madison, Wis.	-2.5
Atlanta, Ga.	-20.0	Manchester, N. H.	-14.0
Austin, Tex.	-4.3	Memphis, Tenn.	-12.4
Baltimore, Md.	-11.7	Miami, Fla.	-17.5
Baton Rouge, La.	-16.0	Milwaukee, Wis.	-4.5
Birmingham, Ala.	-8.0	Minneapolis, Minn.	-4.5
Boise, Idaho	-12.4	Nashville, Tenn.	-15.0
Boston, Mass.	-5.0	Newark, N. J.	+7.0
Bridgeport, Conn.	+2.8	New Haven, Conn.	+3.0
Charleston, W. Va.	-3.5	New Orleans, La.	-7.0
Charlotte, N. C.	-26.0	New York, N. Y.	+2.0
Chattanooga, Tenn.	-22.0	Norfolk, Va.	-20.0
Chicago, Ill.	-1.0	Oakland-San Francisco, Calif.	-8.5
Cincinnati, Ohio	0.0	Oklahoma City, Okla.	-8.0
Cleveland, Ohio	-1.5	Omaha, Nebr.	-7.0
Columbus, Ohio	-7.0	Philadelphia, Pa.	-3.5
Dallas, Tex.	-8.0	Phoenix, Ariz.	-15.0
Dayton, Ohio	+3.5	Pittsburgh, Pa.	-0.7
Denver, Colo.	-7.5	Portland, Maine	-8.8
Des Moines, Iowa	+1.0	Portland, Oreg.	-16.0
Detroit, Mich.	-5.0	Providence, R. I.	-2.5
Duluth, Minn.	-1.8	Richmond, Va.	-22.0
Fort Wayne, Ind.	+1.7	Rochester, N. Y.	-0.7
Grand Rapids, Mich.	-6.0	ST. LOUIS, MO.	0.0
Hartford, Conn.	-1.8	Salt Lake City, Utah	-10.5
Houston, Tex.	-8.7	Savannah, Ga.	-22.0
Indianapolis, Ind.	-2.5	Seattle, Wash.	-16.0
Jackson, Miss.	-21.0	Shreveport, La.	-13.0
Jacksonville, Fla.	-19.0	Tampa, Fla.	-9.5
Jersey City, N. J.	+0.8	Trenton, N. J.	+6.0
Kansas City, Mo.	-4.3	Tulsa, Okla.	-10.5
Knoxville, Tenn.	-13.0	Washington, D. C.	-9.5
Lincoln, Nebr.	-8.7	Wichita, Kans.	-10.5
Little Rock, Ark.	-13.0	Youngstown, Ohio	+3.0

would not be correct to substitute the cost of the living space in the brick veneer house (95.8¢). However, it would be correct to adjust this \$1.21 per cubic foot downward in proportion to the difference in the cost of living space in the five-room brick and the five-room brick veneer. Since the living space in the five-room brick costs 99.5¢ per cubic foot, and that in the five-room brick veneer costs 95.8¢, it is permissible to reduce the \$1.21 by about 4%. Therefore, the living space in a brick veneer ranch house would cost about \$1.16 per cubic foot, compared with the \$1.21 in the brick ranch house.

The total cost of the basement space is naturally governed by the size of the ground area. The exception to this is found in the basement cost of the brick ranch house. Its cost of \$1,580 is the lowest of any of these houses with basements. However, it is of new design and has a lower basement ceiling than the older types of houses and no outside basement entrance. Furthermore, its foundation walls are 8 inches thick compared with 12 inches in the other houses. The California-type bungalow should not be included in this comparison because it has no true basement. There is only a crawl space. The foundation is poured concrete, 6 inches thick, and the cost of the "basement" is made up of the foundation walls, footings, and 4 x 4 wood supports.

NOTE: A bulletin on this same topic was published in 1951. See January 31, 1951, Appraisal Bulletin - Volume XX, Number 5.

WENZLICK CONSTRUCTION COST MANUAL



PUBLISHED AS PART OF

The Real Estate
ANALYST

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ROY WENZLICK & CO.

REAL ESTATE ECONOMISTS, APPRAISERS AND COUNSELORS

SAINT LOUIS 1, MISSOURI

FOREWORD

In designing this new enlarged Wenzlick Cost Manual, effort has been made to include most of those features required for the average residential appraisal. Searching back through the past volumes of the Real Estate Analyst, the editor has selected pertinent articles and, where necessary, had them brought up to date.

The user of this manual will find it divided into three sections. The first includes the plans, specifications, cost tables, and perimeter cost curve information for our nine standard buildings - six of which are residential, two are apartment buildings, and one is a commercial building.

The second section includes additional building cost data presented in a somewhat different fashion. Charts showing construction costs over the past years up until the present are included for a number of different types of structures. In addition, there is cost information for such miscellaneous items as porches, garages, summer cottages, yard improvements, etc.

The third section includes a body of miscellaneous information, all pertinent to real estate appraising, with an emphasis on the residential field. This section includes such items as a lot depth table, depreciation curves, market price calculator, etc.

One of the problems inherent in the publication of a manual such as this is keeping the cost information up to date. The long tables included with each of the standard houses show quarterly data through April 1955. Periodically, supplements will be issued bringing these figures up to date where fluctuations in costs warrant.

All basic cost data shown in this manual are for St. Louis, Missouri. On page 2 will be found a table allowing for the conversion of these costs for some 72 cities located throughout the country. These figures are based on information we have gathered covering selected building material and labor items. The user may wish to adjust the conversion figure shown for his city through the use of personally acquired cost data.

As additional information of this general nature is developed by the Wenzlick research organization it will be made available to active subscribers as additions to the Cost Manual.

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Subscribers \$2.00
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706 Chestnut St.
St. Louis 1, Mo.

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CONSTRUCTION COST VARIATIONS IN 72 CITIES

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Akron, Ohio	+2.8%	Los Angeles, Calif.	-10.5%
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Austin, Tex.	-4.3	Memphis, Tenn.	-12.4
Baltimore, Md.	-11.7	Miami, Fla.	-17.5
Baton Rouge, La.	-16.0	Milwaukee, Wis.	-4.5
Birmingham, Ala.	-8.0	Minneapolis, Minn.	-4.5
Boise, Idaho	-12.4	Nashville, Tenn.	-15.0
Boston, Mass.	-5.0	Newark, N. J.	+7.0
Bridgeport, Conn.	+2.8	New Haven, Conn.	+3.0
Charleston, W. Va.	-3.5	New Orleans, La.	-7.0
Charlotte, N. C.	-26.0	New York, N. Y.	+3.5
Chattanooga, Tenn.	-22.0	Norfolk, Va.	-20.0
Chicago, Ill.	-1.0	Oakland-San Francisco, Calif.	-8.5
Cincinnati, Ohio	0.0	Oklahoma City, Okla.	-8.0
Cleveland, Ohio	-1.5	Omaha, Nebr.	-7.0
Columbus, Ohio	-7.0	Philadelphia, Pa.	-3.5
Dallas, Tex.	-8.0	Phoenix, Ariz.	-15.0
Dayton, Ohio	+3.5	Pittsburgh, Pa.	+2.5
Denver, Colo.	-7.5	Portland, Maine	-8.8
Des Moines, Iowa	+1.0	Portland, Oreg.	-16.0
Detroit, Mich.	-5.0	Providence, R. I.	-2.5
Duluth, Minn.	-1.8	Richmond, Va.	-22.0
Fort Wayne, Ind.	+1.7	Rochester, N. Y.	-0.7
Grand Rapids, Mich.	-6.0	ST. LOUIS, MO.	0.0
Hartford, Conn.	-1.8	Salt Lake City, Utah	-10.5
Houston, Tex.	-8.7	Savannah, Ga.	-22.0
Indianapolis, Ind.	-2.5	Seattle, Wash.	-16.0
Jackson, Miss.	-21.0	Shreveport, La.	-13.0
Jacksonville, Fla.	-19.0	Tampa, Fla.	-9.5
Jersey City, N. J.	+0.8	Trenton, N. J.	+6.0
Kansas City, Mo.	-4.3	Tulsa, Okla.	-10.5
Knoxville, Tenn.	-13.0	Washington, D. C.	-9.5
Lincoln, Nebr.	-8.7	Wichita, Kans.	-10.5
Little Rock, Ark.	-13.0	Youngstown, Ohio	+1.2

STANDARD SIX ROOM FRAME



Content: 24,288 cubic feet
1,650 square feet

DESCRIPTIVE SPECIFICATIONS

GENERAL CONDITIONS

Materials, Labor, Appliances. Unless otherwise specified herein, the contractor shall provide and pay for all materials, labor, water, tools, equipment, permits, light and power necessary for the completion of the Wenzlick standard six-room frame house. Unless otherwise specified, all materials shall be sound, new and of good quality and all work shall be done in a skillful and workmanlike manner.

PREPARATION OF SITE AND EXCAVATION

Excavation shall be of sufficient area and depth to accommodate the building indicated; foundation walls shall be carefully backfilled. Any surplus material not required to grade the plot as designated by plans shall be removed from the premises. Any shortage of materials shall be furnished by the contractor.

Rock excavation is not included in this contract. The contractor will be paid an additional price per cubic foot for rock removal as specified in his bid.

Pumping of other than surface water is not included in the contract price. If spring or other sub-surface water is encountered, the contractor will be paid an additional price per day for keeping the excavation free at the price quoted in his bid or agreed upon between the contractor and the owner.

CONCRETE FOOTINGS AND FOUNDATIONS

Footings and foundation walls shall be installed to dimensions indicated on the plans. The mixture shall be one (1) part Portland Cement, three (3) parts clean sharp sand, five (5) parts broken stone, trap-rock, gravel or other suitable clean coarse aggregate, graded in size to pass through a 2-inch screen, adequately mixed with a sufficient amount of clean water in a mechanical batch mixer, placed in the forms within one-half hour thereafter. Substantial and tight forms shall be built on both inner and outer surface foundations of the walls. No part of excavated material shall be used as a form.

FINISHED CEMENT WORK

The under-course shall be poured over a well tamped 3-inch cinder bed and shall be composed of concrete as specified above, laid level to a thickness of not less than 2-1/2 inches. A finish coat of one (1) part Portland Cement and three (3) parts clean sharp sand shall be applied to a thickness of not less than one (1) inch on top of all concrete under-courses, finished smooth and leveled under a steel trowel. Concrete fill shall be provided for tile floors in the bathroom and lavatory. Front and rear entrance slabs to be 4-inch concrete mixed and finished as specified above.

BRICKWORK AND MASONRY ITEMS

The contractor shall provide all brick work, as specified on the plans, comprising a chimney, as indicated, flues lined with terracotta of proper dimensions, fireplace opening lined with fire brick, equipped with cast-iron throat, and damper and steel smoke chamber. Cast-iron ash dump and clean-out doors provided as indicated.

Common brick shall be laid in running bond with each fifth course a header course, and laid in cement mortar composed of one (1) part bulk lime, three (3) parts clean sharp sand to which may be added 10 per cent hydrated lime. Chimney exposed above the roof shall be laid with face brick. A chimney cap shall be provided as indicated on plans. Mantel shall be of venetian red mantel brick.

LATHING, PLASTERING AND STUCCO

Exterior gable ends (see plans) shall be stuccoed with two-coat work, stucco placed on heavy-gauge expanded metal lath, applied securely to the sheathing and nailed every 12 inches. Both coats of stucco shall be one (1) part Portland Cement and two (2) parts clean sand. The finishing coat shall be textured as directed.

Where tiled walls occur in the bathroom and lavatory, the contractor shall cover with metal lath and cement mortar scratch.

Contractor shall provide for three-coat plastering over rock lath (or expanded metal lath) secured to studs (or joints) at each intersection with blued lath nail, corner beads provided for all exterior angles. The scratch coat shall be one (1) part lime putty to two (2) parts sand, with proper proportions of fiber and sand added. The brown coat shall be one (1) part lime putty to three (3) parts sand. The finished coat shall be one (1) part dry gauged plaster to two (2) parts dry hydrated lime. First grade workmanship is required in the application of each plaster coat. No cornice or other ornamental plaster work is contemplated under this contract.

INSULATION

Four inches of loose insulating material, rock wool or equal, shall cover entire area of second floor ceiling. All exterior walls shall have 4 inches of insulation material. If quilt or bat type is used, it shall be not less than 4 inches thick. Loose fill material, if used, shall be supported vertically every 2 feet and sections so formed between studs packed with sufficient material to insure installation in accordance with manufacturer's instructions. The contractor shall submit for approval both type and trade name of proposed material.

TILING

This specification provides for tiling bathroom and lavatory. Floors shall be prepared by the carpenter and mason, and walls by plaster contractor as specified above. The tile setter shall furnish and install four and a quarter by four and a quarter glazed commercial-grade wall tile with approved caps, cove bases, angles, finials, etc., color to be selected by owner. Tile installed to a height of 3 feet 6 inches and to ceiling around bath tub. Bathroom and lavatory floors shall be 1-inch or 2-inch hexagonal white ceramic tile.

The contractor shall furnish all setting materials and on completion leave the entire work properly grouted and cleaned.

ROUGH CARPENTRY AND FRAMING MATERIAL

Rough carpentry and framing material shall be the best grade provided in local practice. It may be yellow pine, white pine, fir or hemlock. All ma-

for milling.

Floor Joists	2 in. x 10 in. - spaced 16 in. c to c
Ceiling Joists	2 in. x 6 in. - spaced 16 in. c to c
Roof Rafters	2 in. x 6 in. - spaced 16 in. c to c
Studding in exterior walls and interior partitions	2 in. x 4 in. - spaced 16 in. c to c

One line of cross bridging shall be provided for each floor span exceeding 10 feet. Framing shall be in accordance with best practice, using box method for constructing the first floor and platform method above. The entire structure shall be braced and trussed where necessary and securely nailed as required by best practice.

UNDERFLOORING AND SHEATHING

Sheathing on roof and exterior walls and all sub-flooring shall be provided as indicated. Material shall be No. 2, dressed and not over 6 inches wide, laid diagonally for floors and exterior walls and each intersection well secured by two 6d nails.

SIDING AND ROOFING

Exterior walls shall be three quarter by ten-inch redwood siding, cut, fitted and placed with 8 inches exposed to the weather. Roof shall be asphalt 3-in-1 shingles weighing not less than 210 lbs. per square.

PAPER AND FELT

Before placing siding, all exterior sheathing surface shall be covered with one course of approved waterproof building felt, weighing no less than 15 lbs. per square. This material shall be well nailed and lapped not less than 2 inches at all edges, applied in double thickness around all windows and door openings.

Before placing asphalt shingles, the entire roof sheathing shall be covered with waterproof roofing felt weighing not less than 15 lbs. per square. This roof felt shall be well nailed and lapped not less than 2 inches at all edges.

Before placing the finished flooring, all sub-flooring shall be covered with one course of building paper.

FLASHING - SHEET METAL WORK

Provide and install 16-ounce copper flashing for valleys and angles, chimney counter and step flashed. Provide gutters and downspouts (see plans) of 16 ounces copper with necessary fittings, all securely supported by approved hangers and straps.

MILLWORK - WINDOW FRAMES AND SASH

Stock window frames and sash shall be provided of the sizes shown on the plans. These shall be double-hung type as indicated and sash shall be glazed with single-strength clear glass. The sash shall be 1-3/8 inches thick, check-rail type. Exterior door frames shall be 2-inch clear pine rabbeted to receive 1-3/4-inch stock doors.

MILLWORK - INTERIOR

All stock trim necessary to complete the various parts of the work indicated shall be provided. All

casings, base, trim, stools and moulding shall be of yellow pine of the best quality and of approved design as carried in local stock. Exterior doors shall be clear pine 1-3/4 inches thick of the size shown on the plans as selected from local catalog stock. Interior doors shall be of clear pine, six panel colonial design 1-3/8 inches thick of the size indicated on the plans selected from local catalog stock.

FINISHED FLOORS

Finished floors shall be of clear select red oak 2-1/4 inches x 13/16 inches, to be placed over all floor areas on the first and second floors, except the bath and lavatory. Flooring shall be laid tight and even and nailed every 16 inches. All oak flooring shall be scraped or sanded and completed ready for the painters.

BUILT-IN CABINETS

Built-in kitchen cabinets shall be provided as indicated on the plans.

BASEMENT STAIRS

pine.

Basement stairs shall be finished and erected as indicated on the plans. These stairways including stringers, treads and rail shall be of No. 1 yellow

FINISHED STAIRS

Stairs from first to second floor shall be furnished and erected as indicated on the plans properly supported on 2-inch x 8-inch carriages and blocking. Risers shall be of pine B or better, 3/4 x 7 1/2 inches x 3 feet 6 inches; treads of red or white oak, 11 1/2 inches x 1-1/8 inches x 3 feet 6 inches. The rail shall be 2-1/4 inches x 2-3/8 inches. Rail, volute and easing shall be of birch or oak. Balusters with tapered turned necking shall be of birch or pine. The stair-railing shall be of colonial design, all as selected from local catalog stock.

PAINTING

Immediately upon completion of all exterior and interior woodwork the painter shall apply a priming coat consisting of white lead, pure linseed oil and turpentine in the proportions considered best in local practice. Upon completion of the priming coat, all nail holes and other imperfections in the work shall be stopped and filled with white lead putty. Before priming, knots and shakes shall be stopped with one coat of pure orange shellac. Second and third coats shall be mixed and applied in the color selected. Painters may mix at the job all white lead and oil paint in the proportions customary in the locality, using paste, white lead, pure linseed oil, turpentine and dryer, mixed in such proportions as to weigh not less than 15 lbs. per gallon. Painter may use the best qualities of approved ready-mixed paints. Each can must bear the formula of its contents. Materials shall be used direct from this original package and in accordance with the manufacturer's directions. (This contract does not contemplate the painting or decoration of plastered walls and ceilings.) Painter shall oil-stain oak floors in shade selected and fill with an approved paste filler. Floors shall then be finished with three coats of white shellac.

PLUMBING

This specification contemplates a complete plumbing, drainage and water-supply system for one bathroom, one kitchen and one lavatory.

Sewer Line, Vents and Drainage. House sewer line of four inches shall be carried to a point 50 feet beyond foundation walls. Septic tank, drainage field, a connection to public sewer or municipal permits as may be required by local custom are not included. Vent and drainage system shall be installed and tested in accordance with best local practice, municipal code, or requirements of American Society of Sanitary Engineers. All joints shall be filled with oakum and poured lead and well caked. Two-inch vent and waste lines shall be of genuine galvanized wrought iron. Four-inch vitrified tile pipe shall be continued beyond the foundation walls for 50 feet and the joints securely set with cement mortar. Plumber shall excavate and backfill all pipe trenches.

Water Supply. A pipe shall be continued 50 feet beyond the foundation walls in separate trench. This shall be laid using 3/4-inch copper water tubing with sweat-joint fittings. One-half inch copper tubing with sweat-joint pipe and fitting shall be installed for hot and cold water supply and connected with all plumbing fixtures and boiler. (Water closets and boiler shall be provided with cold-water supply only.) All pipe and fitting shall be installed in accordance with manufacturers' instructions.

Fixtures. There shall be furnished and installed to the rough connections here provided fixtures of quality equal to those specified in the following list: (The following list covers items manufactured by the Independent Plumbing and Heating Company. Contractor is permitted to substitute any equal combination.)

60- inch Queen Sink #457

Two Knight Pedestal Lavatories 20 inches x 24 inches over all #224

Two Colonial Vitreous China toilets with white ivoryette seat #344

One 60-inch bath tub #123

Hot Water Supply. A domestic heater is not provided under these specifications. It will be provided under separate order on selection by the owner and cost of connecting and placing the device in operation shall be included under this original plumbing contract.

Alternates. If local building codes and practice do not permit the use of copper tubing and sweat-joint fittings for water supply, the contractor shall furnish genuine wrought-iron galvanized pipe in place thereof. However, where substitution is made, pipe one size larger than specified shall be provided.

HEATING PLANT

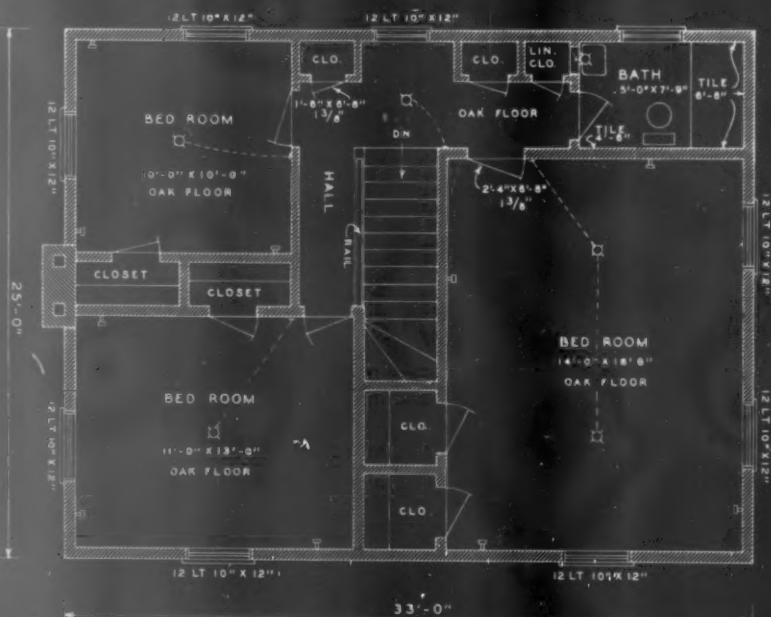
The purpose of this specification is to describe complete installation of the 1-pipe vacuum heating plant. All pipes shall be genuine wrought iron, installed in sizes, pitch and direction as indicated on the heating plans and instructions provided by the manufacturer furnishing the vacuum system accessories.

Radiation. Radiation furnished by this contract consists of a total of 260 square feet. The boiler shall be of capacity and design equal to Red Flash No. 1S5, American Radiator Company #W-2204, complete including insulating jackets, standard fittings and tools.

The contractor shall guarantee the heating plant to heat the entire first and second floors of the house to 70 degrees Fahrenheit when the outside temperature is at Zero Fahrenheit and wind velocity is not in excess of 30 miles per hour, with not less than a 6-hour firing period. This should be accomplished with not more than a 2-pound gauge pressure at the boiler, or with the vacuum at the height specified by the manufacturer of the vacuum system accessories. The plant shall be tested as required and left complete.

Covering - Pipe and Boiler Jacket. The boiler shall have standard insulated

(cont. on page 12)



SECOND FLOOR



FIRST FLOOR



BUILDING COSTS OF A STANDARD SIX-ROOM FRAME HOUSE BUILT IN ST. LOUIS

Costs are grouped into four classifications of material, four of labor and one of overhead. A further breakdown of these groups is given in detail below. Columns of the table are numbered and a brief description of the items included in each is given in the paragraphs below. Paragraphs are numbered to correspond with the columns described. Building material costs are indicated by the letter **M**; corresponding labor items by the letter **L**. No labor items are shown in Column 10. Building Hardware, as they have already been included in Column 5, **Millwork**.

Group A
(1) Masonry: Cement, sand, gravel, quick lime, hydrated lime, hard wall plaster, face and common brick, fire brick, flue lining.

Group B
(2) Tile Work: 4-1/4 x 4-1/4 wall tile, ceramic floor tile, cap and base.

Group C
(3) Unfinished Lumber: Columns, beams, floor and ceiling joists, interior and exterior studs, rafters, bracing, etc.

Group D
(4) Finished Lumber: Sub-flooring, sheathing, finished floors, asphalt shingle roofing, roofing felt, shutters, etc.

Group E
(5) Millwork: Windows, doors, trim, kitchen cabinet, stairs.

Group F
(6) Heating: Heating plant, heating distribution, radiation.

(7) Plumbing: Soil pipes and connections, stack, water pipe and connections, lead cask and bathroom fixtures, water heater and tank to be furnished by others.

Group G
(8) Sheet Metal: Galv. iron (present) gutters, downspouts, flashing.

(9) Electrical Work: Main switch, BX cable, switch boxes, receptacles, transformer, etc. No fixtures included.

(10) Nails and Hardware: Common and wire nails, bolts, damper, ash doors, finish hardware, etc.

(11) Painting: White lead, linseed oil, turpentine, varnish, shellac, filler.

(12) Miscellaneous: Lath, corner bead, insulation.

Group H
Total Material and Labor Costs

(13) Total overhead, profit and other costs. This item includes overhead and profit of subcontractors in plastering, metal work, heating, plumbing, electrical work and tile work; general contractor's profit; and Missouri sales and use tax (low 2% on materials), old age and unemployment tax (Federal and State), liability and employees' compensation insurance, fire and tornado insurance, and completion bond.

TOTAL CONSTRUCTION COST

Year	GROUP A				GROUP B				GROUP C				GROUP D				GROUP E			
	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	Total	Cu. ft. costs	Sq. ft. costs	
1913	\$ 333	\$ 302	\$ 24	\$ 13	\$ 507	\$ 93	\$ 363	\$ 133	\$ 334	\$ 116	\$ 132	\$ 136	\$ 231	\$ 110	\$ 365	\$ 12	\$1890	\$ 1114	\$ 688	
1914	332	302	24	13	501	93	368	133	333	116	132	136	248	110	362	12	1818	1114	688	
1915	350	302	24	13	517	93	378	133	348	118	132	136	259	110	362	12	1835	1162	700	
1916	356	300	24	13	513	99	392	133	346	125	133	144	269	111	362	12	1865	1170	780	
1917	443	406	26	14	545	100	447	134	378	126	144	152	359	122	362	12	2512	1231	859	
1918	524	414	25	15	577	108	510	145	428	137	152	152	359	124	362	12	2812	1257	927	
1919	607	446	25	15	693	118	601	156	495	148	160	160	340	130	362	12	3742	1346	1051	
1920	71	456	26	17	576	166	1063	223	983	211	305	184	372	155	362	12	3606	1540	1219	
1921	655	493	25	16	455	173	822	230	483	216	373	192	460	156	362	12	3499	1517	1121	
1922	592	498	25	16	344	160	628	213	545	200	258	204	433	166	362	12	3111	1391	1087	
1923	615	567	25	21	399	164	709	246	626	232	267	227	430	184	362	12	3280	1925	1168	
1924	601	692	251	108	381	226	696	301	460	264	274	277	388	224	362	12	3376	2435	1399	
1925	589	673	251	108	356	231	634	308	450	289	273	255	381	207	362	12	3268	2391	1356	
1926	550	643	251	108	360	231	634	304	412	276	264	244	381	197	362	12	3181	2287	1315	
1927	549	611	251	108	336	210	639	279	342	263	251	184	395	159	362	12	3062	2110	1236	
1928	547	532	208	97	385	169	576	224	360	211	261	184	382	151	362	12	3017	1799	1147	
1929	549	532	185	97	385	169	614	224	366	211	270	184	385	151	362	12	3029	1759	1148	
1930	461	415	185	97	385	169	586	166	368	197	251	140	341	114	362	12	2869	1386	993	
1931	399	337	155	57	297	98	331	133	282	125	226	112	322	91	362	12	2550	1113	840	
1932	426	337	139	51	264	99	476	133	257	125	210	112	286	91	362	12	2241	1138	799	
1933	444	337	130	51	337	99	502	133	268	125	208	112	270	91	362	12	2592	1107	816	
1934	525	337	122	51	637	133	471	125	294	112	219	91	52	12	362	12	3080	1107	882	
1935	495	415	111	67	378	124	570	166	409	155	238	160	52	14	362	12	2964	1379	917	
1936	492	482	111	67	345	146	568	192	471	180	255	160	50	28	362	12	2945	1582	1044	
1937	489	504	111	67	375	171	663	225	551	212	247	160	386	141	362	12	3164	1713	1168	
1938	494	418	103	67	378	144	578	187	545	171	241	160	297	134	362	12	2978	1484	1088	
1939	499	517	103	77	343	146	590	194	489	182	239	160	277	133	362	12	2699	1647	1125	
1940	496	529	103	77	355	145	592	197	541	187	236	160	282	131	362	12	2997	1651	1147	
1941	496	529	103	77	353	145	582	197	540	187	236	160	285	131	362	12	2979	1651	1147	
1942	496	533	145	86	469	149	682	200	599	189	254	160	294	161	362	12	3332	1717	1248	
1943	501	630	145	86	458	167	722	223	615	210	242	160	286	161	362	12	3350	1893	1286	
1944	473	629	159	86	471	167	688	223	604	210	231	180	274	149	362	12	3281	1932	1299	
1945	496	640	159	86	525	202	711	256	606	241	250	180	274	149	362	12	3468	2042	1350	
1946	500	667	159	86	516	208	710	278	657	262	262	200	289	187	362	12	3633	2209	1447	

Ja 1942	500	685	175	86	509	212	763	280	657	263	262	200	314	187	64	28	48	72	79	33	141	229	81	3633	2236	1451	7220	30.1	4.44
Ap 1942	503	685	175	86	519	212	783	280	682	263	273	200	317	187	64	29	50	72	79	36	141	229	81	3712	2236	1464	7412	30.5	4.49
Ja 1943	505	685	175	86	519	212	781	282	682	263	273	200	317	187	64	29	50	72	79	36	141	229	81	3711	2260	1469	7440	30.6	4.51
Ap 1943	505	685	175	86	530	190	790	252	682	238	273	180	317	149	56	29	50	65	79	36	126	229	75	3709	2047	1403	7159	29.5	4.34
O 1942	505	657	162	86	530	190	790	252	682	238	273	180	317	149	56	29	50	65	79	36	126	229	75	3700	2047	1402	7149	29.4	4.33
Ja 1943	505	657	151	86	532	190	790	252	682	238	273	180	317	149	56	29	50	65	79	36	126	229	75	3700	2047	1402	7149	29.4	4.33
Ap 1943	505	657	151	86	532	190	790	252	682	238	273	180	317	149	56	29	50	65	79	36	126	229	75	3700	2047	1402	7149	29.4	4.33
Ja 1943	505	638	151	99	532	174	790	227	682	213	273	180	317	149	56	20	50	63	79	36	126	228	75	3694	1964	1388	7046	29.0	4.27
Ap 1943	505	638	151	99	532	174	790	227	682	213	273	180	317	149	56	20	50	63	79	36	126	228	75	3694	1964	1388	7046	29.0	4.27
O 1943	513	638	151	99	628	174	898	227	682	213	273	180	317	149	56	20	50	63	79	36	126	228	75	3921	1964	1417	7302	30.1	4.43
Ja 1944	513	638	175	99	628	174	897	227	633	213	273	180	317	149	56	20	50	63	79	36	126	238	75	3695	1964	1414	7273	28.9	4.41
Ap 1944	513	638	175	99	664	174	991	227	633	213	273	180	317	149	56	20	50	63	79	36	126	238	75	3695	1964	1414	7273	28.9	4.41
Ja 1944	513	638	175	99	664	174	991	227	648	213	273	180	317	149	56	20	50	63	79	36	126	238	75	4040	1964	1432	7436	30.6	4.51
Ap 1944	513	638	175	99	664	174	991	227	648	213	273	180	317	149	56	20	50	63	79	36	126	238	75	4040	1964	1432	7436	30.6	4.51
O 1944	522	750	175	99	664	174	994	227	648	213	273	180	317	149	56	20	50	63	79	36	126	246	75	4060	2076	1454	7590	31.8	4.60
Ja 1945	522	751	175	99	664	195	994	254	670	238	273	180	317	149	56	20	50	63	79	36	126	246	91	4082	2167	1484	7733	31.8	4.60
Ap 1945	522	751	175	99	664	195	994	254	670	238	273	180	317	149	56	20	50	63	79	36	126	246	91	4082	2167	1484	7733	31.8	4.60
Ja 1945	536	751	175	99	664	212	994	282	670	264	273	200	317	149	56	20	50	72	79	36	141	246	120	4099	2310	1561	7750	31.7	4.70
Ap 1945	536	751	175	99	664	212	994	282	670	264	273	200	317	149	56	20	50	72	79	36	141	246	120	4099	2310	1561	7750	31.7	4.70
O 1945	588	981	175	113	660	287	999	394	670	331	273	292	320	174	56	20	50	101	79	36	191	246	120	4150	3081	1798	9929	37.1	5.47
Ja 1946	592	1051	175	113	660	303	999	419	670	394	285	308	322	259	59	29	50	111	79	36	204	246	125	4173	3316	1883	9372	38.6	5.68
Ap 1946	598	1072	175	113	678	303	983	419	670	394	306	308	332	259	59	29	50	111	79	36	204	246	125	4173	3316	1883	9372	38.6	5.68
Ja 1946	613	1074	175	113	678	330	999	458	700	432	330	338	339	259	59	29	50	119	79	36	204	246	125	4212	3345	1908	9483	39.0	5.74
Ap 1946	613	1074	175	113	678	330	999	458	700	432	330	338	339	259	59	29	50	119	79	36	204	246	125	4212	3345	1908	9483	39.0	5.74
O 1946	628	1139	175	113	686	330	1014	458	708	432	330	383	272	59	29	70	127	81	41	204	253	130	4516	3570	2030	10116	41.6	6.13	
Ja 1947	627	1321	214	131	1076	358	1508	508	870	481	353	398	404	319	102	29	73	127	115	176	234	317	153	5933	4037	2423	12392	51.0	7.51
Ap 1947	636	1321	214	131	1117	358	1568	508	870	481	353	398	404	319	102	29	73	127	115	176	234	317	153	5933	4037	2423	12392	51.0	7.51
Ja 1947	652	1321	214	131	1117	358	1568	508	870	481	353	398	404	319	102	29	73	127	115	176	234	317	153	5933	4037	2423	12392	51.0	7.51
Ap 1947	652	1321	214	131	1117	358	1568	508	870	481	353	398	404	319	102	29	73	127	115	176	234	317	153	5933	4037	2423	12392	51.0	7.51
O 1947	689	1321	214	147	556	358	1491	508	1037	461	409	398	432	319	114	29	76	127	134	164	234	315	153	6011	4053	2476	12540	51.6	7.60
Ja 1948	709	1440	258	147	992	374	1525	517	1058	488	456	398	457	359	145	29	73	137	139	164	254	340	153	6314	4264	2809	13187	54.3	7.99
Ap 1948	714	1440	258	147	992	374	1531	517	1081	488	504	398	501	359	117	29	73	137	139	164	254	340	153	6314	4264	2809	13187	54.3	7.99
Ja 1948	728	1529	258	151	992	402	1531	552	1089	508	528	442	517	359	130	40	75	139	139	187	259	361	184	6820	4579	2846	14045	57.8	8.31
Ap 1948	728	1529	258	151	992	402	1531	552	1089	508	528	442	517	359	130	40	75	139	139	187	259	361	184	6820	4579	2846	14045	57.8	8.31
O 1948	735	1530	258	164	992	402	1539	552	1089	508	568	442	517	359	130	40	75	139	139	187	259	361	184	6820	4579	2846	14045	57.8	8.31
Ja 1949	744	1530	258	164	952	402	1498	552	1440	253	575	442	554	359	130	40	79	139	149	196	259	361	184	6928	4324	2836	14096	56.0	8.54
Ap 1949	742	1507	258	172	935	397	1480	560	1449	253	571	442	522	375	130	40	78	139	149	196	278	370	178	6872	4335	2824	14031	57.8	8.50
Ja 1949	742	1545	245	172	935	402	1498	560	1416	253	571	442	522	375	130	40	78	139	149	196	278	370	178	6872	4335	2824	14031	57.8	8.50
Ap 1949	742	1545	245	172	935	402	1498	560	1416	253	571	442	522	375	130	40	78	139	149	196	278	370	178	6872	4335	2824	14031	57.8	8.50
O 1949	742	1545	245	172	975	402	1418	560	1416	253	571	442	491	375	130	40	79	139	149	196	278	370	178	6881	4384	2803	13868	57.1	8.40
Ja 1950	742	1545	245	172	875	402	1418	560	1416	253	567	442	483	375	130	40	81	139	150	189	278	370	178	6666	4384	2799	13849	57.0	8.39
Ap 1950	744	1545	245	172	849	402	1468	560	1444	253	571	442	477	375	130	40	81	139	150	189	278	370	178	6716	4384	2805	13905	57.2	8.43
Ja 1950	753	1606	260	172	930	409	1545	572	1444	259	571	442	495	375	130	40	79	139	149	195	278	370	178	6940	4384	2796	13820	56.9	8.38
Ap 1950	770	1607	255	172	1079	412	1723	577	1644	259	576	442	528	375	130	40	81	142	150	188	287	448	184	7572	4487	3027	14598	82.2	9.15
O 1950	760	1643	255	181	1025	451	1661	637	1648	288	576	440	548	375	130	40	83	142	150	191	287	448	183	7505	4676	3066	15247	82.8	9.24
Ja 1951	820	1643	255	181	1106	451	1911	637	1701	288	584	440	589	375	108	53	85	142	150	191	287	452	183	7950	4680	3137	15767	64.9	9.56
Ap 1951	820	1643	255	181	1106	451	1911	637	1701	288	584	440	589	375	108	53	85	142	150	191	287	452	183	7950	4680	3137	15767	64.9	9.56
Ja 1951	835	1764	255	193	987	489	1831	684	1687	311	657	440	581	389	108	53	84	142	150	191	324	452	201	7816	4990	3220	16026	66.0	9.71
Ap 1951	835	1764	255	193	987	489	1831	684	1687	311	657	440	581	389	108	53	84	142	150	191	324	452	201	7816	4990	3220	16026	66.0	9.71
O 1951	835	1764	255	193																									

(cont. from page 7)

jacket as regularly furnished by manufacturer, lined with not less than 1-inch thickness of asbestos sheet insulation, and 4-inch asbestos fill shall be placed on floor within jacket. All exposed supply pipes in the cellar and within building walls shall be covered with approved 2-inch air-cel asbestos covering. All exposed covering shall be banded at the joints with brass strapping.

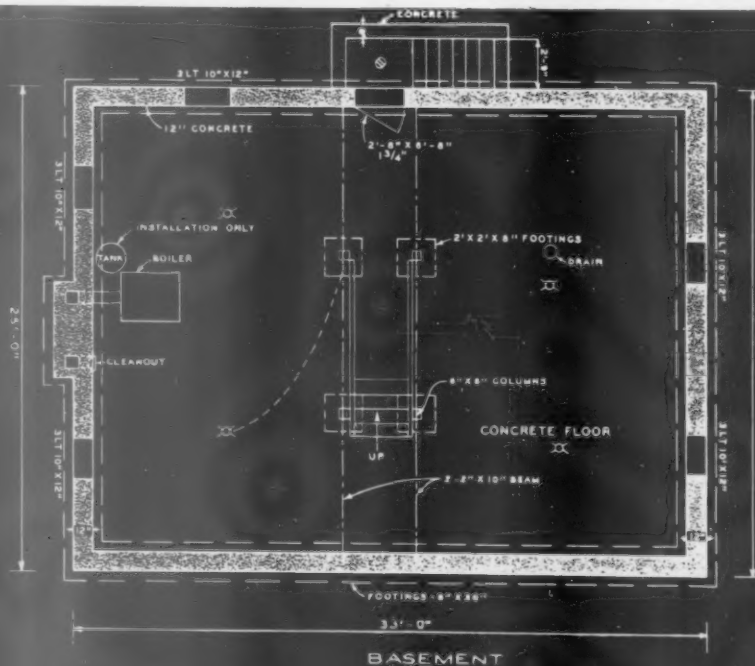
Painting. All exposed pipes in the basement as well as any exposed unfinished cast-iron parts of the boiler shall receive two coats of approved smoke-stack black. All radiators, and any exposed pipes above the first floor level shall be thoroughly cleaned and receive two coats of approved heat-resisting radiator paint in color selected.

ELECTRIC WIRING

It is the purpose of this specification to describe a complete electrical installation. All material shall be of standard make and of quality and installed as required by the National Board of Fire Underwriters. All outlets shall terminate in approved metal boxes. Switches shall be of toggle type. All outlets other than for lighting fixtures and switches shall be equipped with standard duplex connections. Wiring to outlets shall be of approved-size BX cable of sufficient size to carry the circuit load.

Each circuit shall be switched and fused and extended to a central panel board. This contractor shall terminate all circuits at an appropriate meter and fuse board.

Connection from meter panel to public service lines is not included in this contract, nor are electrical fixtures and appliances provided.



"PERIMETER-AREA" METHOD OF ESTIMATING CONSTRUCTION COSTS OF A TWO-STORY FRAME HOUSE

The reproduction cost of a two-story frame house, with specifications similar to the one discussed in the preceding pages, may be estimated by totaling the following three cost items:

1. Outside wall perimeter costs.
2. Fixed cost items.
3. Total interior floor area costs.

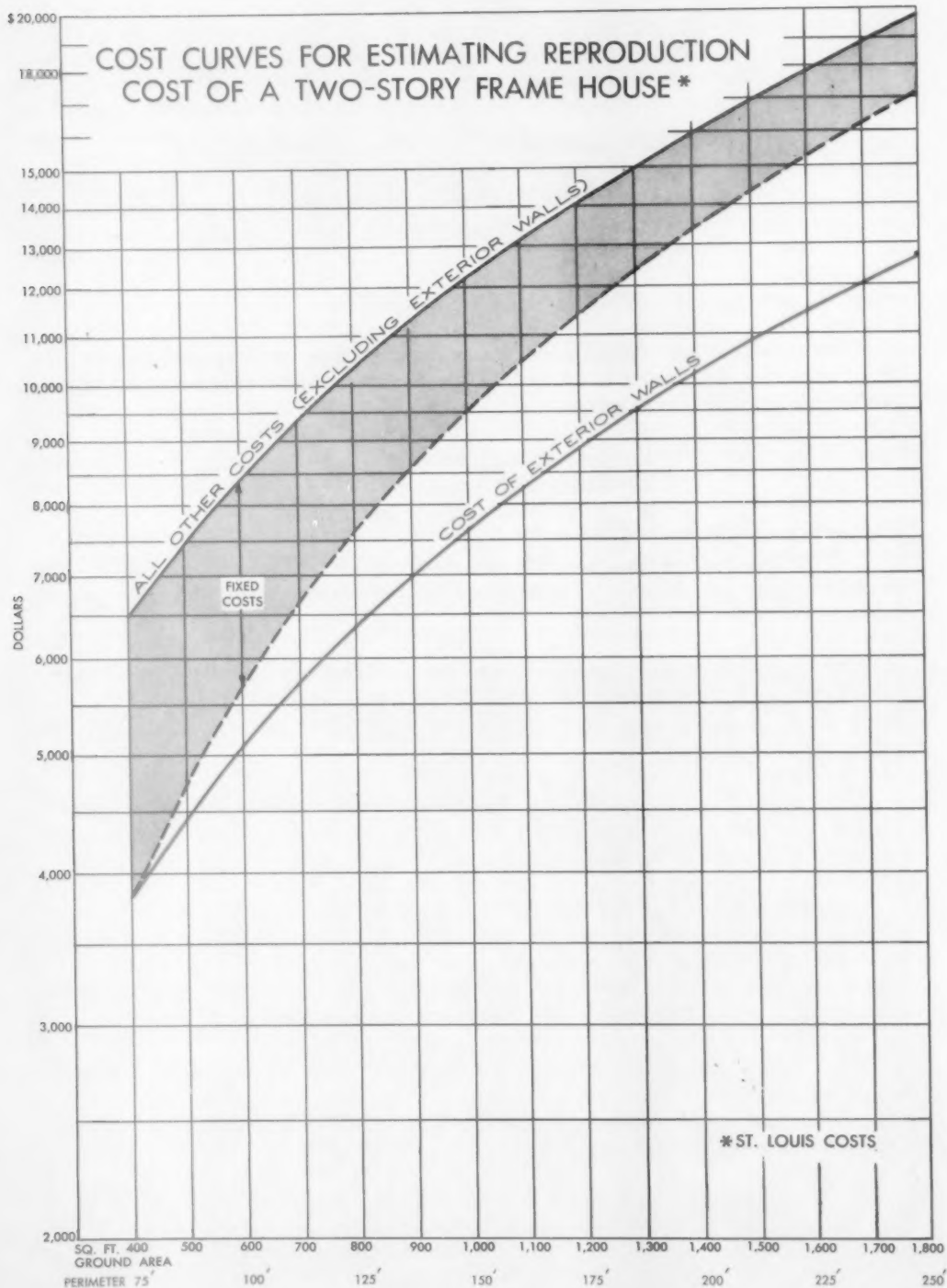
All outside wall perimeter costs are shown by the red line on the chart. This is done to take into account irregularly shaped houses or houses with large perimeters.

The fixed cost items consist of those items which will cost the same regardless of the size of the house. Included in this category are the costs of the fireplace and chimney, stairs, bathroom tile work, kitchen sink, plumbing fixtures, and medicine cabinet.

The remainder of the total cost of the house is based on the square feet of ground area covered, and is shown in combination with the fixed cost items by the solid blue line on the charts.

The chart on the back of this sheet is used in this manner. Assume a two-story frame house with 125 feet of perimeter and 900 square feet of ground area. The red line shows that the perimeter cost would be \$6,350, and the solid blue line shows that all other costs in this house with 900 square feet of ground area would be \$11,300. The total cost, therefore, would be \$17,650.

For a house with more than 1,000 square feet of ground area, a 10% factor should be added for better workmanship. Also, these larger houses will have extra bathroom or lavatories. To the fixed costs add \$750 for an extra full bath and \$400 for an extra lavatory.



FIVE ROOM BRICK VENEER HOUSE



Content: 24,910 cubic feet
1,165 square feet

DESCRIPTIVE SPECIFICATIONS

GENERAL CONDITIONS - Same as 6-room frame house.

PREPARATION OF SITE AND EXCAVATION - Same as 6-room frame house.

CONCRETE FOOTINGS AND FOUNDATIONS - Same as 6-room frame house, with the following additions: Foundation walls to be 12-inch poured concrete.

FINISHED CEMENT WORK - Same as 6-room frame house.

BRICKWORK AND MASONRY ITEMS - The contractor shall provide all brickwork as specified in plans, comprising exterior veneer, a chimney, flues lined with terra cotta of proper dimensions, fireplace opening lined with firebrick equipped with cast iron throat and damper and steel smoke chamber. Cast iron ash dump and cleanout doors provided as indicated. Mantel is to be of venetian red mantel brick. Four-inch brick veneer is to be laid with weathered joints and with galvanized clips every seventh course. There is to be a one-inch air space between the brick veneer and the wood sheathing.

LATHING AND PLASTERING - Same as for 6-room frame house, except that there is no stucco.

INSULATION - Same as 6-room frame house (1st floor instead of 2nd floor ceiling).

TILING - This specification provides for tiling bathroom and kitchen. Floors shall be prepared by the carpenter and mason, and walls by plaster contractor as specified above. The tile setter shall furnish and install four and a quarter by four and a quarter glazed commercial-grade wall tile with approved caps, cove bases, angles, finials, etc., color to be selected by owner. Tile installed to a height of 3 feet 6 inches, to ceiling around tub in bathroom and to a height of 3 feet 6 inches in the kitchen.

ROUGH CARPENTRY AND FRAMING MATERIAL - Same as 6-room frame house.

PAPER AND FELT - Before laying veneer wall, all exterior sheathing surface shall be covered with one course of approved waterproof building felt, weighing no less than 15 lbs. per square. This material shall be well nailed and lapped not less than 2 inches at all edges, applied in double thickness around all windows and door openings.

Before laying the finished floor there shall be one thickness of 15 lb. waterproof roofing felt placed over the sub-flooring. This material shall be well nailed and lapped not less than 2 inches at all edges.

Before placing the finished flooring, all sub-flooring shall be covered with one course of building paper.

FLASHING AND SHEET METAL WORK - Same as 6-room frame house.

MILLWORK - WINDOW FRAMES AND SASH - Same as 6-room frame house.

MILLWORK - INTERIOR - Same as 6-room frame house.

FINISHED FLOORS

Finished floors shall be of clear select red oak 2-1/4 inches x 13/16 inches, to be placed over all floor areas except the bath. Flooring shall be laid tight and even and nailed every 16 inches. All oak flooring shall be scraped or sanded and completed ready for the painters.

BUILT-IN KITCHEN CABINETS - Same as 6-room frame house.

BASEMENT STAIRS - Same as 6-room frame house.

FINISHED STAIRS - Same as 6-room frame house except no stair rail is required.

PAINTING - Same as 6-room frame house.

PLUMBING - This specification contemplates a complete plumbing, drainage and water-supply system for one bathroom and one kitchen.

Sewer Line, Vents and Drainage - Same as 6-room frame house.

Water Supply. A pipe shall be continued 50 feet beyond the foundation walls in separate trench. This shall be laid using 3/4-inch copper water tubing with sweat-joint fittings. One-half inch copper tubing with sweat-joint pipe and fitting shall be installed for hot and cold water supply and connected with all plumbing fixtures and boiler. (Water closet shall be provided with cold-water supply only.) All pipe and fitting shall be installed in accordance with manufacturers' instructions.

Fixtures. There shall be furnished and installed to the rough connections here provided fixtures of quality equal to those specified in the following list: (The following list covers items manufactured by the Independent Plumbing and Heating Company. Contractor is permitted to substitute any equal combination.)

60-inch Queen sink #457

One Knight Pedestal Lavatory 20 inches x 24 inches over all #224

One Colonial Vitreous China toilet with white ivoryette seat #344

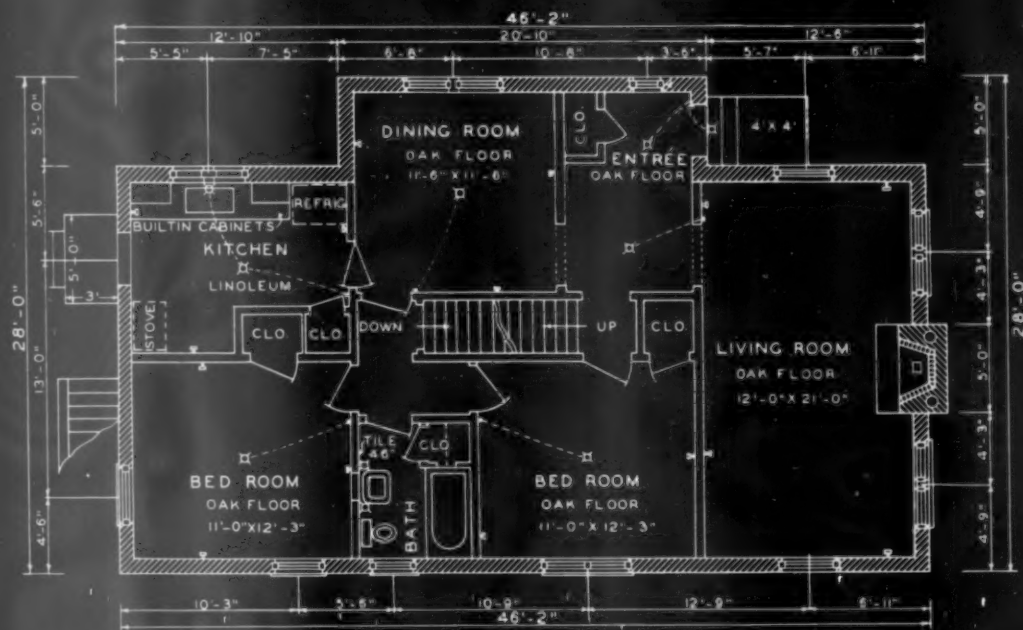
One 60-inch bath tub #123

Hot Water Supply - Same as 6-room frame house.

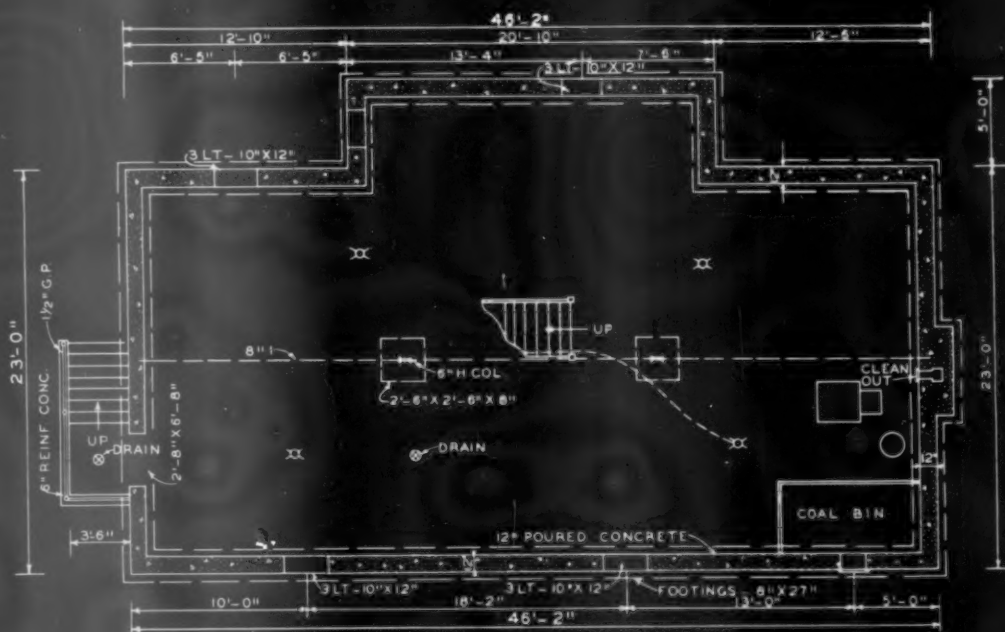
Alternates - Same as 6-room frame house.

HEATING PLANT - The contractor shall install one forced circulation combination furnace (24 inches) and blower with automatic humidifier complete with necessary leads and returns made of 26-gauge galvanized steel. The contractor shall guarantee the heating plant to heat the entire living quarters of the house (including present unfinished attic space) to 70 degrees F. when the outside temperature is 0 degrees F., and wind velocity not in excess of 30 miles per hour, with not less than a 6-hour firing period.

ELECTRIC WIRING - Same as 6-room frame house.



FIRST FLOOR



BASEMENT

BUILDING COSTS OF A FIVE ROOM

Costs are grouped into four classifications of material, four of labor and one of overhead. A further breakdown of these groups is given in detail below. Columns of the table are numbered, and a brief description of the items included in each is given in the paragraphs below. Paragraphs are numbered to correspond with the columns described. Building material costs are indicated by the letter M; corresponding labor items by the letter L; labor items are shown in Column 10, Building Hardware, as they have already been included in Column 9, Millwork.

Group A
(1) Masonry: Cement, sand, gravel, quick lime, hydrated lime, hard wall plaster, face brick, common brick, fire brick, flue lining.

Group B
(2) Tile Work: 4-1/4 x 4-1/4 wall tile, ceramic floor tile, cap and base.

Group C
(3) Unfinished Lumber: Columns, beams, floor and ceiling joists, interior and exterior studs, rafters, bracing, etc.

Group D
(4) Finished Lumber: Sub-flooring, sheathing, finished floors, asphalt shingle roofing, roofing felt, gutters, etc.

Group E
(5) Millwork: Windows, doors, trim, kitchen cabinet, stairs.

(6) Heating: Heating plant, heating distribution, radiation.

Year	GROUP A			GROUP B			GROUP C			GROUP D			GROUP E			TOTAL
	M	L	Costs	M	L	Costs	M	L	Costs	M	L	Costs	M	L	Costs	
1913	\$ 397	\$ 577	\$ 15	\$ 242	\$ 58	\$ 272	\$ 122	\$ 18	\$ 224	\$ 87	\$ 65	\$ 14	\$ 36	\$ 38	\$ 68	\$ 342
1914	437	577	15	265	98	235	115	18	228	87	59	14	33	38	68	343
1915	445	577	15	263	105	202	129	19	245	92	68	15	38	41	71	355
1916	453	569	15	346	105	239	131	19	253	92	101	15	46	41	82	370
1917	559	638	16	389	106	312	195	206	19	314	108	15	60	43	92	439
1918	635	654	16	395	116	311	191	211	321	97	95	16	53	43	96	463
1919	769	708	16	6	124	564	103	122	324	102	83	18	46	52	108	547
1920	909	756	16	6	122	564	103	122	324	102	83	18	46	52	108	547
1921	836	772	16	7	387	162	131	166	30	470	130	64	26	54	85	589
1922	752	771	16	7	386	169	136	166	30	470	130	64	26	54	85	589
1923	783	844	16	445	195	437	162	173	184	36	442	146	70	39	64	598
1924	749	995	201	427	238	428	198	379	101	397	176	64	34	36	78	636
1925	744	994	201	412	244	403	203	364	181	44	398	164	68	35	72	636
1926	695	994	201	417	233	420	183	334	208	182	42	398	156	69	35	624
1927	697	994	201	390	221	398	184	275	198	179	40	396	129	87	52	619
1928	696	917	166	430	179	361	148	260	199	168	32	377	120	71	36	604
1929	993	917	140	425	179	380	148	294	199	168	32	377	120	71	36	604
1930	994	927	140	394	171	370	110	243	116	161	24	317	101	74	35	604
1931	925	970	125	378	168	348	88	266	137	119	21	283	93	32	68	604
1932	947	970	112	365	168	348	88	266	137	119	21	283	93	32	68	604
1933	544	870	105	377	105	320	88	279	95	146	19	283	74	53	15	519
1934	657	870	98	452	105	427	88	368	95	152	19	283	74	53	15	519
1935	625	727	91	404	131	365	110	411	118	156	34	303	91	43	19	446
1936	623	727	91	404	131	365	110	411	118	156	34	303	91	43	19	446
1937	609	818	91	415	181	425	149	453	153	212	56	348	111	54	26	446
1938	608	696	83	359	153	343	125	447	120	204	46	319	103	47	22	446
1939	608	696	83	370	155	359	128	402	137	207	46	319	103	47	22	446
1940	609	853	83	399	152	371	139	419	137	215	50	228	108	56	21	446
1941	609	853	83	405	152	389	129	439	137	215	50	228	108	56	21	446
1942	609	853	83	410	152	389	129	439	137	215	50	228	108	56	21	446
1943	609	852	114	505	197	440	131	466	128	215	60	244	127	63	21	446
1944	621	986	114	508	176	460	147	488	142	218	66	210	132	60	33	446
1945	621	986	114	508	176	460	147	488	142	218	66	210	132	60	33	446
1946	611	1012	126	508	202	445	169	485	146	218	66	210	132	60	33	446
1947	613	1095	126	508	219	439	183	507	178	219	90	250	143	100	36	446

BRICK HOUSE BUILT IN ST. LOUIS

(7) Plumbing: Soil pipes and connections, stack, water pipe and connections, lead oakum and bathroom fixtures, water heater and tank to be furnished by others.

Group D
(8) Sheet Metal: Galv. iron (present) gutters, downspouts, flashing.

Group E
(9) Electrical Work: Main switch, BX cable, switch boxes, receptacles, transformer, etc. No fixtures included.

(10) Nails and Hardware: Common and wire nails, bolts, damper, ash doors, finish hardware, etc.

(11) Painting: White lead, linseed oil, turpentine, varnish, shellac, filler.

(12) Miscellaneous: Lath, corner bead, insulation.

TOTAL MATERIAL AND LABOR COSTS
Subtotal overhead, profit and other costs. This item includes overhead and profit of subcontractors in plastering, metal work, heating, plumbing, electrical work and tile work; general contractor's profit; and Missouri sales tax (now 2% on materials), old age and unemployment tax (Federal and State), liability and employees' compensation insurance, fire and tornado insurance, and completion bond.

TOTAL CONSTRUCTION COST

Year	GROUP A			GROUP B			GROUP C			GROUP D			GROUP E			TOTAL
	M	L	Costs	M	L	Costs	M	L	Costs	M	L	Costs	M	L	Costs	
1913	\$ 397	\$ 577	\$ 15	\$ 242	\$ 58	\$ 272	\$ 122	\$ 18	\$ 224	\$ 87	\$ 65	\$ 14	\$ 36	\$ 38	\$ 68	\$ 342
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1938	608	696	83	359	153	343	125	447	120	204	46	319	103	47	22	446
1939	608	696	83	370	155	359	128	402	137	207	46	319	103	47	22	446
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1941	609	853	83	405	152	389	129	439	137	215	50	228	108	56	21	446
1942	609	853	83	410	152	389	129	439	137	215	50	228	108	56	21	446
1943	609	852	114	505	197	440	131	466	128	215	60	244	127	63	21	446
1944	621	986	114	508	176	460	147	488	142	218	66	210	132	60	33	446
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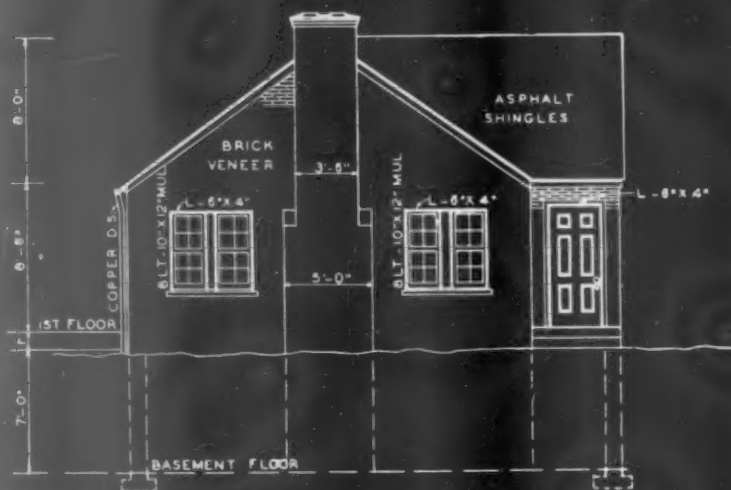
Group C
(3) Unfinished Lumber: Columns, beams, floor and ceiling joists, interior and exterior studs, rafters, bracing, etc.

Group D
(4) Finished Lumber: Sub-flooring, sheathing, finished floors, asphalt shingle roofing, roofing felt, gutters, etc.

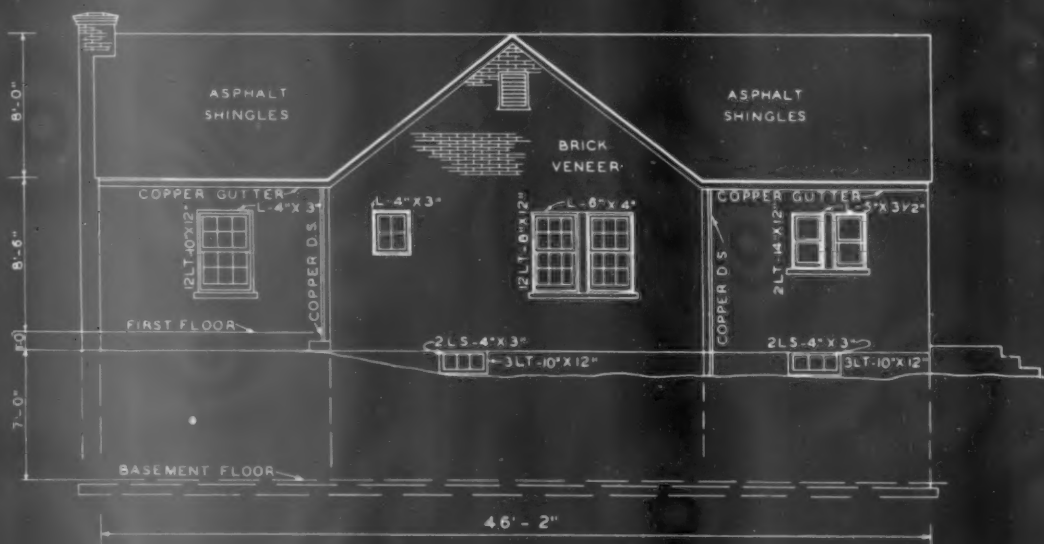
Group E
(5) Millwork: Windows, doors, trim, kitchen cabinet, stairs.

(6) Heating: Heating plant, heating distribution, radiation.

Ja 1942	613	1113	138	106	538	224	431	185	507	178	219	90	241	144	58	36	49	56	84	56	114	172	80	3106	2328	1340	6774	27.2	5.82
Ap 1942	640	1113	138	108	541	224	445	185	525	178	219	90	235	159	58	36	51	56	84	58	114	171	80	3171	2328	1349	6847	27.5	5.88
Ap 1942	640	1113	138	108	542	227	449	187	525	179	219	90	235	159	58	36	51	56	84	58	114	171	76	3165	2357	1355	6877	27.6	5.90
O 1942	640	1051	128	108	539	201	457	187	525	160	218	90	235	124	53	36	51	51	84	58	102	171	74	3159	2164	1299	6622	26.6	5.69
Ja 1943	640	1051	119	108	539	201	457	187	525	160	229	90	236	124	53	36	51	51	84	58	102	167	74	3158	2164	1299	6621	26.6	5.69
Ap 1943	640	1051	119	108	539	201	457	187	525	160	229	90	236	124	53	36	51	51	83	58	102	167	74	3155	2164	1298	6617	26.6	5.69
Ap 1943	640	981	119	125	539	184	457	151	525	143	227	58	236	124	53	36	51	50	84	58	102	167	74	3156	2051	1273	6480	26.0	5.58
O 1943	640	981	119	125	539	184	450	151	525	143	227	58	236	124	53	24	51	50	84	58	102	179	74	3338	2014	1282	6634	26.6	5.69
Ja 1944	640	981	138	125	626	184	593	151	529	143	226	58	236	124	53	24	51	50	84	58	102	179	74	3413	2014	1300	6727	27.0	5.77
Ap 1944	640	981	138	125	659	184	618	151	529	143	226	58	236	124	53	24	51	50	84	58	102	179	74	3471	2014	1308	6793	27.3	5.84
Ap 1944	640	981	138	125	659	184	618	151	538	143	226	58	236	124	53	24	51	50	84	58	102	179	74	3480	2014	1320	6814	27.4	5.86
O 1944	658	1102	138	125	659	184	621	151	538	143	226	58	236	124	53	24	51	50	84	58	102	185	88	3508	2157	1347	7012	28.1	6.01
Ja 1945	689	1117	138	125	659	208	621	160	607	161	226	58	236	132	53	24	51	50	84	58	102	185	88	3577	2230	1373	7180	28.6	6.18
Ap 1945	673	1117	138	125	659	208	621	160	607	171	226	58	236	132	53	24	51	50	84	58	102	185	88	3577	2230	1373	7180	28.6	6.18
Ap 1945	673	1117	138	125	659	208	621	160	607	171	226	58	236	132	53	24	51	50	84	58	114	185	88	3584	2309	1395	7286	29.3	6.22
O 1945	749	1530	139	142	650	317	625	261	607	250	226	58	239	208	53	24	51	79	84	58	154	185	118	3866	3139	1644	8449	33.9	7.23
Ja 1946	753	1609	139	142	650	333	625	276	607	267	230	84	242	213	59	36	51	87	84	58	185	185	113	3683	3325	1715	8723	35.0	7.48
Ap 1946	766	1699	139	142	675	333	605	276	607	267	230	84	240	213	59	36	51	83	84	58	185	185	113	3709	3421	1745	8875	35.6	7.61
Ap 1946	766	1723	139	142	675	360	625	301	622	263	243	84	271	213	59	36	62	83	84	62	185	185	113	3825	3523	1789	9137	36.7	7.85
O 1946	766	1723	139	142	683	360	631	301	701	263	241	84	291	233	59	36	70	90	84	62	185	185	145	3963	3571	1846	9400	37.7	8.06
Ja 1947	936	1901	169	165	977	378	1178	319	858	318	353	84	402	298	104	36	67	99	134	120	205	258	153	5686	4075	2327	12088	48.5	10.37
Ap 1947	968	1901	169	165	1024	378	1240	319	879	313	308	84	323	266	78	36	67	99	128	127	196	241	153	5382	3810	2180	11472	46.1	9.86
Ap 1947	973	1901	169	165	835	378	1049	319	879	313	308	84	332	266	78	36	71	99	128	127	196	241	153	5556	3810	2206	11672	46.9	10.03
O 1947	1013	1901	169	184	881	378	1067	319	946	313	307	84	362	266	86	36	70	99	129	120	196	237	153	5386	3929	2223	11538	46.3	9.90
Ja 1948	1042	1981	206	184	928	391	1111	326	960	318	353	84	402	298	104	36	67	99	134	120	205	258	153	5686	4075	2327	12088	48.5	10.37
Ap 1948	1051	1981	206	184	936	391	1100	326	989	318	362	84	416	298	80	36	68	99	134	129	205	272	153	5743	4075	2328	12146	48.8	10.43
Ap 1948	1079	2193	206	196	937	426	1100	355	1025	345	362	84	431	299	84	36	68	106	134	129	209	272	183	5827	4429	2438	12694	51.0	11.10
O 1948	1068	2193	206	206	948	426	1106	355	1025	345	376	112	466	299	88	49	68	106	134	129	209	272	183	5906	4486	2540	12932	51.9	11.10
Ja 1949	1114	2193	206	208	910	426	1101	355	1205	242	376	112	463	299	88	49	73	109	142	137	209	272	183	6087	4383	2543	13013	52.2	11.16
Ap 1949	1113	2202	195	217	896	424	1088	354	1217	242	376	112	439	301	88	49	73	109	142	137	225	272	171	6036	4406	2535	12977	52.1	11.14
Ap 1949	1113	2225	195	217	817	424	1004	354	1179	242	365	112	402	304	88	49	73	109	142	136	225	280	176	5794	4437	2499	12730	51.1	10.93
O 1949	1113	2225	195	217	817	424	1017	354	1194	242	365	112	423	304	88	49	73	109	142	136	225	280	176	5843	4437	2510	12790	51.3	10.97
Ja 1950	1113	2225	195	217	817	424	1017	354	1194	242	365	112	409	304	88	49	75	109	144	129	325	280	176	5806	4437	2505	12768	51.3	10.97
Ap 1950	1114	2225	195	217	806	424	1062	354	1230	242	368	112	402	304	88	49	75	109	144	129	325	280	176	5844	4437	2514	12845	51.6	11.03
Ap 1950	1151	2318	207	217	891	432	1077	361	1230	246	369	140	420	311	88	60	75	111	144	129	335	329	182	6110	4615	2620	13345	53.6	11.45
O 1950	1175	2318	203	217	1018	432	1210	361	1401	246	386	140	446	311	88	60	75	111	144	127	335	344	182	6617	4615	2707	13939	56.0	11.96
Ja 1951	1243	2406	203	228	983	435	1117	397	1405	275	362	140	439	311	88	60	76	111	145	129	335	344	182	6554	4780	2729	14063	56.5	12.07
Ap 1951	1276	2406	203	228	1043	435	1117	397	1459	275	362	140	491	311	77	39	76	111	144	129	332	344	182	6723	4756	2757	14236	57.1	12.22
Ap 1951	1276	2406	203	228	953	435	1089	397	1459	275	407	151	402	304	88	49	73	109	144	129	332	344	182	6653	4765	2751	14169	56.9	12.16
O 1951	1287	2548	203	243	953	472	1092	425	1447	297	407	151	491	325	77	39	77	111	153	129	362	344	201	6660	5074	2840	14574	58.5	12.51
Ja 1952	1287	2548	203	243	954	472	1070	425	1436	297	407	151	489	325	77	39	76	111	153	129	362	344	201	6625	5074	2835	14534	58.3	12.48
Ap 1952	1287	2548	203	247	933	472	1053	425	1421	297	407	151	481	325	68	34	92	111	168	129	362	344	201	6603	5083	2837	14523	58.3	12.47
Ap 1952	1287	2548	209	247	942	472	1053	425	1352	297	405	151	475	335	59	29	92	111	168	129	362	344	201	6510	5078	2820	14413	57.9	12.37
O 1952	1287	2548	196	254	947	472	1053	425	1349	297	405	151	481	353	59	29	92	111	168	129	362	344	201	6510	5103	2827	14440	58.0	12.39
Ja 1953	1287	2571	196	254	947	472	1053	439	1349	297	405	151	481	357	109	54	92	111	168	129	362	344	206	6560	5164	2879	14603	58.6	12.53
Ap 1953	1350	2571	196	254	971	472	1053	439	1417	297	395	151	483	357	118	59	91	111	171	129	362	341	206	6715	5169	2904	14788	59.4	12.69
Ap 1953	1352	2571	196	254	970	472	1053	439	1414	297	443	151	480	357	122	61	88	111	171	129	362	341	206	6760	5171	2923	14854	59.6	12.75
O 1953	1354	2571	198	268	947	472	1079	429	1426	297	443	151	487	357	122	61	89	111	172	129	362	341	206	6787	5185	2936	14908	59.8	12.80
Ja 1954	1380	2571	196	268	941	472	1079	429	1437	297	443	151	487	357	122	61	90	111	175	128	362	341	206	6819	5185	2941	14945	60.0	



FRONT ELEVATION



SIDE ELEVATION

**"PERIMETER-AREA" METHOD OF ESTIMATING
CONSTRUCTION COSTS OF A
ONE-STORY BRICK VENEER HOUSE**

The reproduction cost of a one-story brick veneer house with specifications similar to the one discussed in the preceding pages, may be estimated by totaling the following three cost items:

1. Outside wall perimeter costs.
2. Fixed cost items.
3. Total interior floor area costs.

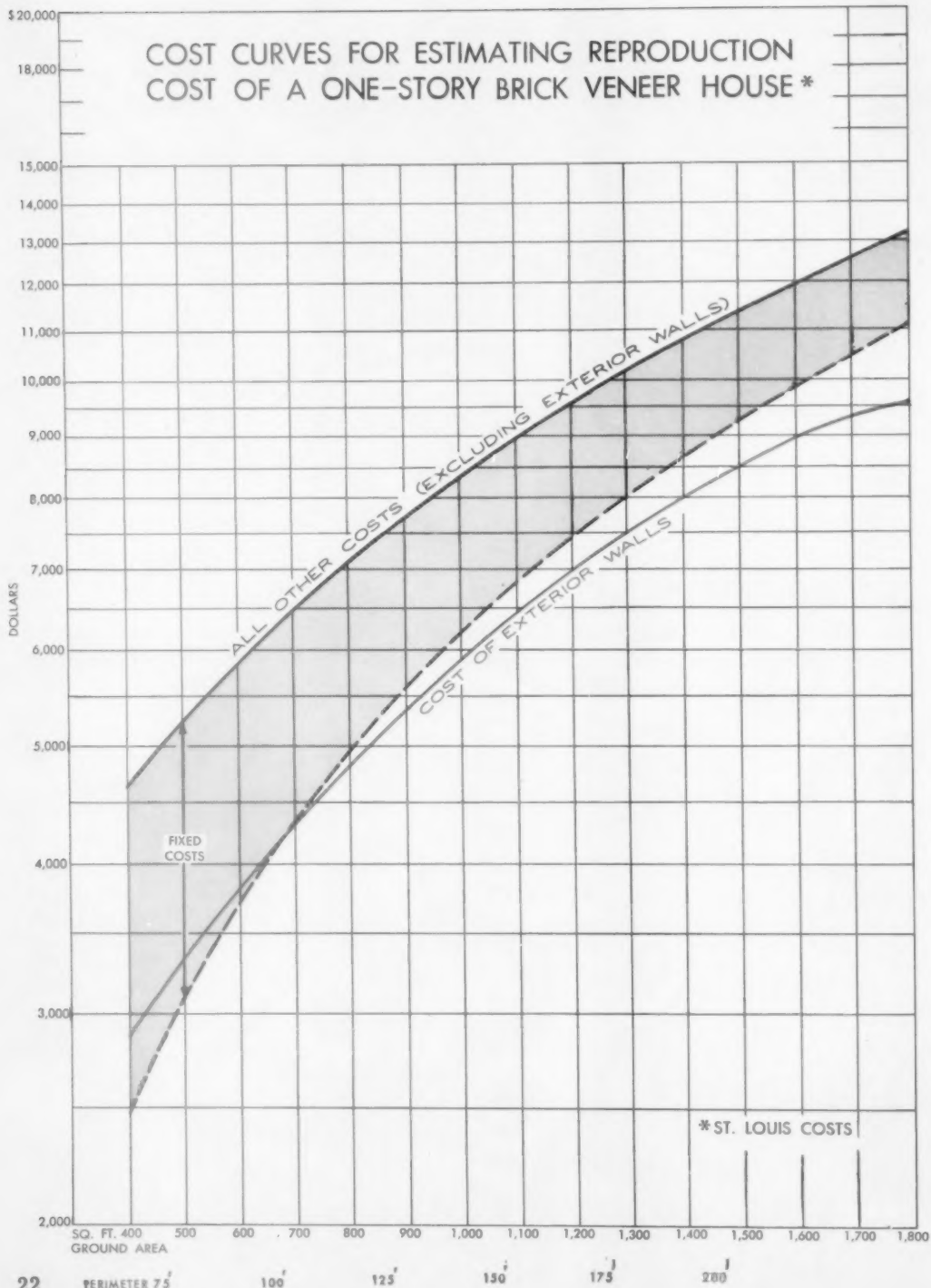
All outside wall perimeter costs are shown by the red line on the chart. This is done to take into account irregularly shaped houses or houses with large perimeters.

The fixed cost items consist of those items which will cost the same regardless of the size of the house. Included in this category are the costs of the fireplace and chimney, stairs, bathroom tile work, kitchen sink, plumbing fixtures, and medicine cabinet.

The remainder of the total cost of the house is based on the square feet of ground area covered, and is shown in combination with the fixed cost items by the solid blue line on the charts.

The chart on the back of this sheet is used in this manner. Assume a one-story brick veneer house with 150 feet of perimeter and 1,300 square feet of ground area. The red line shows that the perimeter cost would be \$5,850 and the solid blue line shows that all other costs in this house with 1,300 square feet of ground area would be \$10,200. The total cost, therefore, would be \$16,050.

For a house with more than 1,500 square feet of ground area, a 10% factor should be added for better workmanship. Also, these larger houses will have extra bathroom or lavatories. To the fixed costs add \$750 for an extra full bath and \$400 for an extra lavatory.



SIX-ROOM BRICK HOUSE



Content: 23,100 cubic feet
1,520 square feet

DESCRIPTIVE SPECIFICATIONS

GENERAL CONDITIONS

Materials, Labor, Appliances. Unless otherwise specified herein, the contractor shall provide and pay for all materials, labor, water, tools, equipment, permits, light and power necessary for the completion of the Wenzlick standard six-room brick house. Unless otherwise specified, all materials shall be sound, new and of good quality and all work shall be done in a skillful and workmanlike manner.

PREPARATION OF SITE AND EXCAVATION

The contractor shall clear the site of all trees, brush, etc., which come within the area of the proposed building. He shall carefully remove and stack on the plot the top soil for making the lawn.

Excavation shall be of sufficient area and depth to accommodate the building indicated; foundation walls shall be carefully backfilled. Any surplus material not required to grade the plot as designated by plans shall be removed from the premises. Any shortage of materials shall be furnished by the contractor.

Rock excavation is not included in this contract. The contractor will be paid an additional price per cubic foot for rock removal as specified in his bid.

Pumping of other than surface water is not included in the contract price. If spring or other sub-surface water is encountered, the contractor will be paid an additional price per day for keeping the excavation free at the price quoted in his bid or agreed upon between the contractor and the owner.

CONCRETE FOOTINGS AND FOUNDATIONS

Footings and foundation walls shall be installed to dimensions indicated on the plans. The mixture shall be one (1) part Portland Cement, three (3) parts clean sharp sand, five (5) parts broken stone,

trap-rock, gravel or other suitable clean coarse aggregate, graded in size to pass through a 2" screen, adequately mixed with a sufficient amount of clean water in a mechanical batch mixer, placed in the forms within one-half hour thereafter. Substantial and tight forms shall be built on both inner and outer surface foundations of the walls. No part of excavated material shall be used as a form.

FINISHED CEMENT WORK - Same as 6-room frame house (no lavatory). See August 1950 Appraisal Bulletin.

BRICKWORK AND MASONRY ITEMS

The contractor shall provide all brickwork as specified on the plans, comprising the exterior walls of variegated matt brick backed with 5" x 8" x 12" hollow clay tile, chimney, as indicated, with

flues lined with terracotta of proper dimensions, fireplace opening lined with fire brick, equipped with cast-iron throat and damper and steel smoke chamber. Cast-iron ash dump and clean-out doors provided as indicated.

The brick for the exterior walls shall be laid in running bond with each fifth course a header course, and laid in cement mortar composed of one (1) part bulk lime, three (3) parts clean sharp sand to which may be added 10 per cent hydrated lime. Chimney exposed above the roof shall be laid with face brick. A chimney cap shall be provided as indicated on plans. Mantel shall be of venetian red mantel brick.

LATHING AND PLASTERING All interior walls and ceilings shall be covered with three coats of plaster. Plaster shall be applied directly to the inside surface (hollow tile) of the exterior masonry walls. Interior stud partitions and ceilings shall be covered with three coats of plaster over rock lath (or expanded metal lath) secured to studs (or joists) at each intersection with blued lath nail, corner beads provided for all exterior angles. The scratch coat shall be one (1) part lime putty to two (2) parts sand, with proper proportions of fiber and sand added. The brown coat shall be one (1) part lime putty to three (3) parts sand. The finished coat shall be one (1) part dry gauged plaster to two (2) parts dry hydrated lime. First grade workmanship is required in the application of each plaster coat. No cornice or other ornamental plaster work is contemplated under this contract.

Where tiled walls occur in the bathroom, the contractor shall cover with metal lath and cement mortar scratch.

INSULATION Four inches of loose insulating material, rock wool or equal, shall cover entire area of second floor ceiling.

TILING This specification provides for tiling bathroom floor and walls; the floor shall be prepared by the carpenter and mason, and the walls by plaster contractor as specified above. The tile setter shall furnish and install 4-1/4 x 4-1/4 glazed commercial-grade wall tile with approved caps, cove bases, angles, etc.; color to be selected by owner. Tile installed to height of 3' 6" in the bathroom and to the ceiling around the bath tub. Bathroom floor shall be 1" or 2" hexagonal white ceramic tile. The contractor shall furnish all setting materials and on completion leave the entire work properly grouted and cleaned.

ROUGH CARPENTRY AND FRAMING MATERIAL Rough carpentry and framing material shall be the best grade provided in local practice. It may be yellow pine, white pine, fir or hemlock. All material shall be of sizes indicated, with allowance for milling. All joists, studs and rafters shall be spaced 16" c to c, and one line of cross bridging shall be provided for each floor span exceeding 10 feet.

UNDERFLOORING AND SHEATHING Sheathing on roof and all sub-flooring shall be provided as indicated. Material shall be No. 2, dressed and not over 6" wide, laid diagonally for floors and each intersection well secured by two 6d nails.

ROOFING

Roof shall be asphalt 3-in-1 shingles, weighing not less than 210 lbs. per square.

PAPER AND FELT

Before placing asphalt shingles the roof surface shall be covered with one course of approved waterproof building felt weighing not less than 15 lbs. per square. Material to be well nailed and lapped at least 2" at all edges. Before placing the finished flooring all sub-flooring shall be covered with 1 course of building paper.

FLASHING - SHEET METAL WORK - Same as 6-room frame house.

MILLWORK - INTERIOR - Same as 6-room frame house.

FINISHED FLOORS - Same as 6-room frame house.

BUILT-IN CABINETS - Built-in kitchen cabinets shall be provided as shown on plans.

BASEMENT STAIRS - Same as 6-room frame house.

FINISHED STAIRS

Stairs from first to second floor shall be furnished and erected as indicated on the plans properly supported on 2" x 8" carriages and blocking. Risers shall be of pine B or better, $3/4 \times 7\frac{1}{2} \times 3' 6"$; treads of red or white oak, $11\frac{1}{2} \times 1-1/8 \times 3' 6"$.

PAINTING - Same as 6-room frame house.

PLUMBING

This specification contemplates a complete plumbing, drainage and water-supply system for one bathroom and one kitchen.

Sewer Line, Vents and Drainage - Same as 6-room frame house.

Water Supply - Same as 6-room frame house.

Fixtures. There shall be furnished and installed to the rough connections here provided fixtures of quality equal to those specified in the following list: (The following list covers items manufactured by the Independent Plumbing and Heating Company. Contractor is permitted to substitute any equal combination.)

60" Queen sink #457

One Knight pedestal lavatory 20" x 24" over all #224

One Colonial vitreous china toilet with white ivoryette seat #344

One 60" bath tub #123

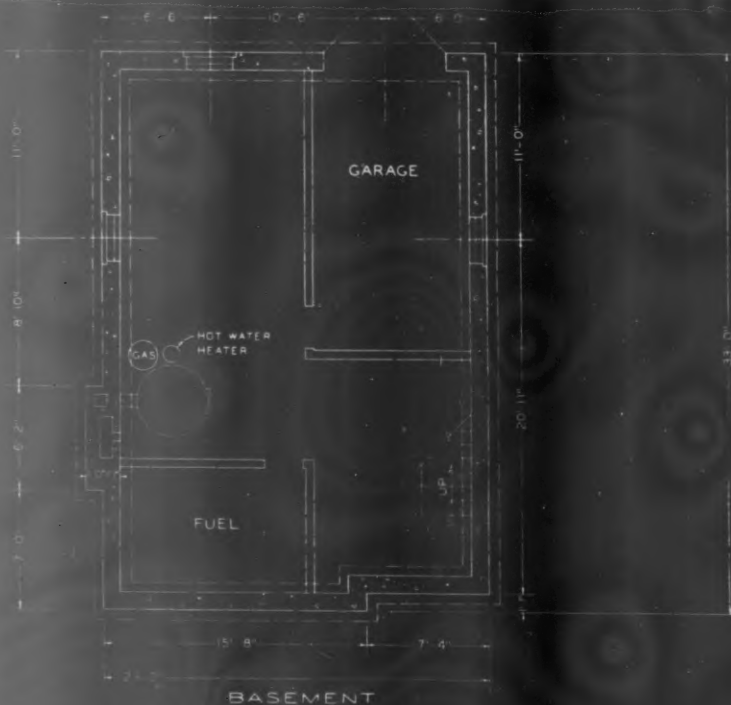
Hot Water Supply - Same as 6-room frame house.

Alternates - Same as 6-room frame house.

HEATING PLANT

The contractor shall install one forced circulation combination furnace (24") and blower with automatic humidifier complete with necessary leads and returns made of 26-gauge galvanized steel. The contractor shall guarantee the heating plant to heat the entire living quarters of the house to 70 degrees F. when the outside temperature is 0 degrees F. and the wind velocity not in excess of 30 miles per hour, with not less than a 6-hour firing period.

ELECTRIC WIRING - Same as 6-room frame house.





BUILDING COSTS OF A SIX-ROOM BRICK HOUSE BUILT IN SAINT LOUIS

MATERIAL

1. Cost of face brick, salmon brick, backing tile, flue lining and building stone.
2. Cost of all materials going into mortar, concrete, cement and plaster.
3. Cost of all lumber, flooring, millwork, roofing and paint.
4. Cost of all materials for plumbing, heating, electrical work, sheet metal work, iron work, hardware, tiling and accessories.
5. TOTAL MATERIAL COST.

Year	1	2	3	4	5
1913	\$ 433	\$226	\$ 613	\$2132	
1914	524	227	833	552	2136
1915	411	228	819	578	2036
1916	455	217	687	716	2255
1917	618	268	1081	927	2894
1918	689	312	1348	967	3336
1919	787	358	1739	959	3873
1920	1053	451	2084	1239	4827
1921	791	407	1322	1044	3564
1922	846	357	1477	954	3634
1923	867	370	1552	1098	3875
1924	783	375	1412	1015	3616
1925	735	353	1462	1091	3736
1926	717	333	1354	1055	3458
1927	708	337	1185	1032	3262
1928	692	331	1231	929	3183
1929	665	331	1269	851	3116
1930	660	294	1081	809	2944
1931	638	256	956	764	2614
1932	572	281	948	711	2482
1933	641	299	1160	621	2721
1934	675	313	1485	735	3208
1935	667	310	1330	768	3075
1936	667	310	1255	810	3042
1937	695	300	1478	827	3300
1938	694	301	1311	766	3092
1939	604	294	1248	751	2897
Ja 1940	638	294	1275	733	2940
Ap 1940	627	294	1314	742	2977
Ja 1940	627	294	1314	742	2977
O 1940	627	300	1365	742	3234
Ja 1941	649	303	1465	756	3273
Ap 1941	649	303	1465	756	3266
Ja 1941	649	313	1452	756	3361
O 1941	665	316	1685	807	3473

LABOR

6. Cost of setting all stone, laying brick and pouring concrete.
7. Cost of labor on tishing and plastering.
8. Cost of carpentry, roofing, flooring, painting and builder's general supervision.
9. Cost of installing plumbing material and fixtures, wiring, heating plant and sheet metal work.
10. Cost of excavation, grading and landscaping.
11. TOTAL LABOR COST.

	6	7	8	9	10	11
\$	308	\$250	\$ 575	\$183	\$111	\$ 1425
313	250	577	163	111	1434	
310	250	578	195	111	1444	
332	250	580	202	111	1465	
352	250	671	211	111	1595	
358	260	719	312	123	1672	
403	270	775	231	123	1802	
443	270	1152	248	160	2273	
453	290	1152	262	160	2317	
471	300	1080	277	160	2268	
490	300	1168	316	179	2453	
625	350	1395	346	197	2903	
673	350	1400	385	197	3007	
646	300	1398	354	197	2895	
641	300	1395	347	197	2895	
631	275	1395	337	197	2835	
682	240	1395	335	204	2756	
572	163	1132	334	195	2406	
501	158	970	332	140	2101	
411	135	832	273	123	1774	
388	142	721	287	118	1656	
389	142	721	287	118	1656	
501	199	825	287	131	1943	
521	210	960	287	152	2157	
584	211	1118	257	165	2335	
501	182	954	235	131	2003	
493	245	861	235	131	1965	
607	275	1054	235	166	2307	
607	275	1054	235	166	2307	
617	275	933	243	166	2234	
582	275	954	247	166	2224	
662	289	1087	247	215	2510	
650	280	1112	247	224	2523	
755	302	1239	247	224	2682	
755	302	1330	285	224	2896	

OVERHEAD

12. TOTAL OVERHEAD, PROFIT AND OTHER COSTS. This item includes overhead and profit of subcontractors in plastering, metal work, heating, plumbing, electrical work and tile work, general contractor's profit; and Missouri sales tax (now 2% on materials), old age and unemployment tax (Federal and State), liability and employees' compensation insurance, fire and tornado insurance, and completion bond.
13. TOTAL CONSTRUCTION COST.

	12	13	Cu.ft. Cost	Sq.ft. Cost
\$	684	\$ 4241	18.46	\$2.79
684	4254	18.4	1.60	
680	4160	18.0	2.74	
690	4410	19.1	2.90	
727	5216	22.6	3.43	
754	5762	24.9	3.79	
839	6514	28.2	4.29	
906	8006	34.7	5.27	
847	6728	29.1	4.43	
1051	6953	30.1	4.57	
1164	7492	32.4	4.93	
1279	7817	33.8	5.14	
1383	8026	34.7	5.28	
1371	7725	33.4	5.08	
1358	7503	32.5	4.94	
1286	7304	31.6	4.81	
1191	7063	30.6	4.65	
1088	6856	27.1	4.12	
868	5573	24.1	3.51	
797	5053	21.9	3.52	
771	5148	22.3	3.39	
830	5694	24.6	3.75	
943	5961	25.8	3.92	
1023	6222	26.9	4.09	
1168	6831	29.6	4.49	
1143	6238	27.0	4.10	
1230	6092	26.4	4.01	
1364	6611	28.6	4.35	
1373	6657	28.8	4.38	
1366	6577	28.5	4.33	
1407	6865	29.7	4.52	
1578	7361	31.9	4.84	
1462	7191	31.1	4.73	
1522	7585	32.9	4.99	
1588	7957	34.4	5.23	

Ja 1942	665	316	1608	867	3456	769	307	1378	285	231	2970	1611	0037	34.8	5.23
Ap 1942	717	320	1652	958	3647	769	307	1378	285	231	2970	1611	0037	35.8	5.45
Ja 1943	717	320	1652	958	3647	769	307	1378	285	231	2970	1611	0037	36.1	5.48
Ap 1943	717	320	1652	958	3647	694	323	1239	247	224	2727	1615	7989	34.6	5.26
O 1942	717	320	1652	958	3647	694	323	1239	247	224	2727	1615	7989	34.6	5.26
Ja 1943	717	320	1652	958	3647	694	323	1239	247	224	2727	1615	7989	34.6	5.26
Ap 1943	717	320	1652	958	3647	694	323	1239	247	224	2727	1615	7989	34.6	5.26
O 1943	717	326	1837	958	3838	656	312	1152	247	224	2591	1625	8054	34.9	5.30
Ja 1944	717	326	1892	958	3892	656	312	1152	247	224	2591	1635	8119	35.1	5.34
Ap 1944	717	326	1960	958	3961	656	312	1152	247	224	2591	1647	8199	35.5	5.39
Ja 1945	762	334	2058	958	4112	656	312	1152	247	224	2591	1651	8224	35.6	5.41
Ap 1945	762	336	2058	958	4116	729	312	1258	247	314	2860	1690	8452	36.6	5.56
Ja 1946	801	343	2047	960	4171	729	312	1258	247	314	2860	1726	8698	37.7	5.72
Ap 1946	801	343	2047	960	4171	729	312	1258	247	314	2860	1727	8703	37.7	5.73
O 1946	801	343	2047	960	4171	729	312	1258	247	314	2860	1727	8703	37.7	5.73
Ja 1947	819	433	3360	1163	5715	733	350	1384	287	314	3068	1762	8904	38.5	5.86
Ap 1947	882	433	3403	1177	5875	733	350	1384	287	314	3068	1762	8904	38.5	5.86
Ja 1948	1025	492	3250	1445	6212	987	382	1848	387	364	3968	1758	9057	42.8	6.50
Ap 1948	1025	492	3250	1445	6212	987	382	1848	387	364	3968	1758	9057	42.8	6.50
O 1948	1050	506	3360	1640	6576	1074	401	1946	387	364	4074	1958	10100	43.7	6.64
Ja 1949	1100	510	3460	1575	6645	1074	401	1946	387	364	4074	2013	10368	44.9	6.82
Ap 1949	1100	510	3460	1575	6645	1074	401	1946	387	364	4074	2013	10368	44.9	6.82
Ja 1950	1100	510	3460	1575	6645	1074	401	1946	387	364	4074	2013	10368	44.9	6.82
Ap 1950	1100	510	3460	1575	6645	1074	401	1946	387	364	4074	2013	10368	44.9	6.82
Ja 1951	1251	538	3762	1589	7140	1212	450	2116	500	385	4663	2076	10708	46.4	7.04
Ap 1951	1251	538	3762	1589	7140	1212	450	2116	500	385	4663	2076	10708	46.4	7.04
Ja 1952	1329	561	3875	1630	7395	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ap 1952	1329	561	3875	1630	7395	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
O 1952	1329	561	3875	1630	7395	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ja 1953	1329	561	3875	1630	7395	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ap 1953	1329	561	3875	1630	7395	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
O 1953	1329	561	3875	1630	7395	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ja 1954	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ap 1954	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ja 1955	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ap 1955	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
O 1955	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ja 1956	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ap 1956	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
O 1956	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ja 1957	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ap 1957	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
O 1957	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ja 1958	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ap 1958	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
O 1958	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ja 1959	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ap 1959	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
O 1959	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ja 1960	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ap 1960	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
O 1960	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ja 1961	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ap 1961	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
O 1961	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ja 1962	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ap 1962	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
O 1962	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ja 1963	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ap 1963	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
O 1963	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ja 1964	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ap 1964	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
O 1964	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ja 1965	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ap 1965	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
O 1965	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ja 1966	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ap 1966	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
O 1966	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ja 1967	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ap 1967	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
O 1967	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ja 1968	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ap 1968	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
O 1968	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ja 1969	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ap 1969	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
O 1969	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ja 1970	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ap 1970	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
O 1970	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ja 1971	1350	583	3923	1718	7474	1212	450	2116	500	385	4663	2133	10958	47.4	7.21
Ap 1971	1350	583	3923	1718	7474	1212	450	21							

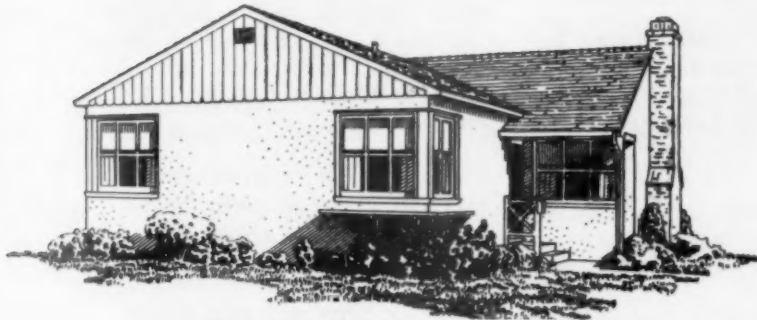


RIGHT SIDE ELEVATION



FRONT ELEVATION

CALIFORNIA BUNGALOW



Content: 12, 119 cubic feet
992 square feet

DESCRIPTIVE SPECIFICATIONS

GENERAL CONDITIONS

Materials, Labor, Appliances. Unless otherwise specified herein, the contractor shall provide and pay for all materials, labor, water, tools, equipment, permits, light and power necessary for the completion of the Wenzlick California bungalow. Unless otherwise specified, all materials shall be sound, new and of good quality and all work shall be done in a skillful and workmanlike manner.

PREPARATION OF SITE AND EXCAVATION

The contractor shall clear the site of all trees, brush, etc., which come within the area of the building. Excavation shall be of sufficient depth to carry the footings below the frost line.

Rock excavation is not included in this contract. The contractor will be paid an additional price per cubic foot for rock removal as specified in his bid.

CONCRETE FOOTINGS AND FOUNDATIONS

Footings shall be 6" x 12" poured concrete and foundation walls shall be 6" poured concrete as indicated on the plans. The mixture shall be one (1) part Portland Cement, three (3) parts clean sharp sand, five (5) parts broken stone, trap-rock, gravel or other suitable clean coarse aggregate, graded in size to pass through a 2" screen, adequately mixed with a sufficient amount of clean water in a mechanical batch mixer. Substantial and tight forms shall be built on both inner and outer surface foundations of walls. No part of excavated material shall be used as a form.

FINISHED CEMENT WORK

Concrete entrance slabs and a slab for the future garage shall be 4" poured concrete. A smooth finish coat of one (1) part Portland Cement and two (2) parts sharp clean sand shall be applied to a thickness of not less than one-half inch to the top surface of entrance slabs and the slab for the future garage. Concrete filling shall be provided for tile floor in the bathroom.

**BRICKWORK AND
MASONRY ITEMS**

The contractor shall provide all brickwork as specified on the plans, comprising chimney, flues lined with flue lining of proper dimensions, fireplace opening lined with fire brick, equipped with cast-iron throat. Outer face of fireplace is to be venetian red mantel brick. Cement mortar shall be composed of one (1) part bulk lime, three (3) parts clean sharp sand to which shall be added 10% Portland Cement. A chimney cap shall be provided as indicated on the plans.

STUCCO

The surface of the outer walls shall be covered with three (3) coats of one to three (1 to 3) Portland Cement stucco over metal lath. The third coat shall be tinted, color to be selected by the owner.

LATHING AND PLASTERING - Same as 6-room frame house.

INSULATION

Four inches of loose insulating material, rock wool or equal, shall cover entire area of the ceiling.

TILING

This specification provides for tiling bathroom floor and walls; the floor shall be prepared by the carpenter and mason, and the walls by plaster contractor as specified above. The tile setter shall furnish and install 4-1/4 x 4-1/4 glazed commercial-grade wall tile with approved caps, cove bases, angles, etc.; color to be selected by owner. Tile installed to height of 3' 6" in the bathroom and to the ceiling around the bath tub. Bathroom floor shall be 1" or 2" hexagonal white ceramic tile.

The contractor shall furnish all setting materials and on completion leave the entire work properly grouted and cleaned.

**ROUGH CARPENTRY
AND FRAMING MATERIAL**

Rough carpentry and framing material shall be the best grade provided in local practice. It may be yellow pine, white pine, fir or hemlock. All material shall be of sizes indicated, with allowance for milling.

Floor Joists 2" x 6" - spaced 16" c to c
Ceiling Joists 2" x 4" - spaced 16" c to c
Roof Rafters 2" x 4" - spaced 16" c to c
Studding in exterior walls
and interior partitions 2" x 4" - spaced 16" c to c

One line of 2" x 3" cross bridging shall be provided for each joist span over 8'. Framing shall be in accordance with best practice. The entire structure shall be braced and trussed where necessary and securely nailed as required by best practice. Floor joists shall be supported by three 4 x 6 girders resting on fourteen 4 x 4 posts supported by concrete piers as indicated on plans. Sheathing on roof and all sub-flooring shall be provided as indicated. Material shall be number two (No. 2), 1 x 6 or 1 x 8 boards laid diagonally for floors, and each inter-section well secured by two 6d nails.

PAPER AND FELT

Before placing exterior metal lath all exterior surface shall be covered with one course of approved waterproof building paper. This material shall be well nailed and lapped not less than 2" at all edges, applied in double thickness along all window and door openings.

Before placing asphalt shingles, the entire roof sheathing shall be covered with waterproof roofing felt weighing not less than 15 lbs. per square. This roof felt shall be well nailed and lapped not less than 2" at all edges.

Before placing the finished flooring, all sub-flooring shall be covered with one course of 15-lb. waterproofed roofing felt well nailed and lapped not less than 2" at all edges.

FLASHING - SHEET METAL WORK

Provide and install 16-ounce copper flashing for valleys and angles, chimney counter and step flashed. Provide gutter and downspout (see plans) of 16-ounce copper with necessary fittings, all securely supported by approved hangers and straps.

MILLWORK - WINDOW FRAMES AND SASH

Stock window frames and sash shall be provided of the sizes shown on the plans. These shall be double-hung type as indicated, with the exception of two stationary plate glass windows. Sash shall be glazed with double-strength clear glass provided completely with jam-proof (Stanley or equal) pulleys, weights and sash cord. The sash shall be 1-3/8" thick, check-rail type. Exterior door frames shall be 2" clear pine rabbeted to receive 1-3/4" stock doors. Two (2) suitable attic ventilators shall be installed as shown on plans.

INTERIOR MILLWORK - Same as 6-room frame house.

FINISHED FLOORS

Finished floors shall be of clear select red oak 2-1/4" x 13/16", to be placed over all floor areas except the bath. Flooring shall be laid tight and even and nailed every 16". All oak flooring shall be scraped or sanded and completed ready for the painters.

CABINETS

Built-in kitchen cabinets shall be provided as indicated in the plans.

PAINTING - Same as 6-room frame house.

PLUMBING

This specification contemplates a complete plumbing, drainage and water-supply system for one bathroom and one kitchen.

Sewer Line, Vents and Drainage - Same as 6-room frame house.

Water Supply - Same as 6-room frame house.

Fixtures. There shall be furnished and installed to the rough connections here provided fixtures of quality equal to those specified in Crane or Kohler catalogues, or approved by the owner. They shall include one pedestal lavatory, one vitreous china toilet, one 60" bath tub with shower. (Sink provided for in Cabinets.)

Hot Water Supply. A domestic heater is not provided under these specifications. It will be provided under separate order on selection by the owner and cost of connecting and placing the device in operation shall be included under this original plumbing contract.

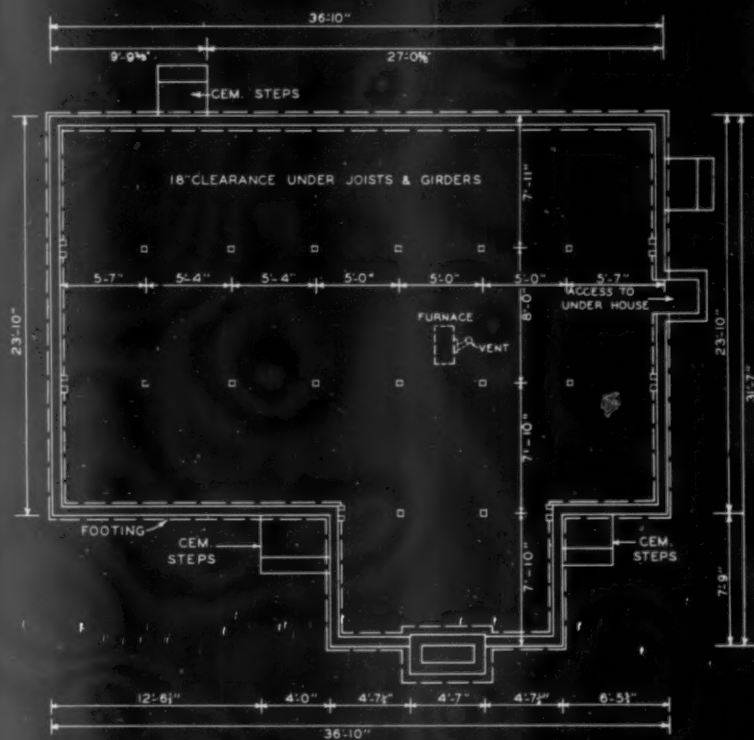
Alternates. If local building codes and practice do not permit the use of copper tubing and sweat-joint fitting for water supply, the contractor shall furnish genuine wrought-iron galvanized pipe in place thereof. However, where substitutions are made, pipe one size larger than specified shall be provided.

HEATING PLANT Heating plant shall be dual gas floor furnace of sufficient size to keep the entire house heated to 70 degrees F. when the outside temperature is 0 degrees F. and the wind velocity not in excess of 30 miles per hour. Installation shall be as indicated on the plans.

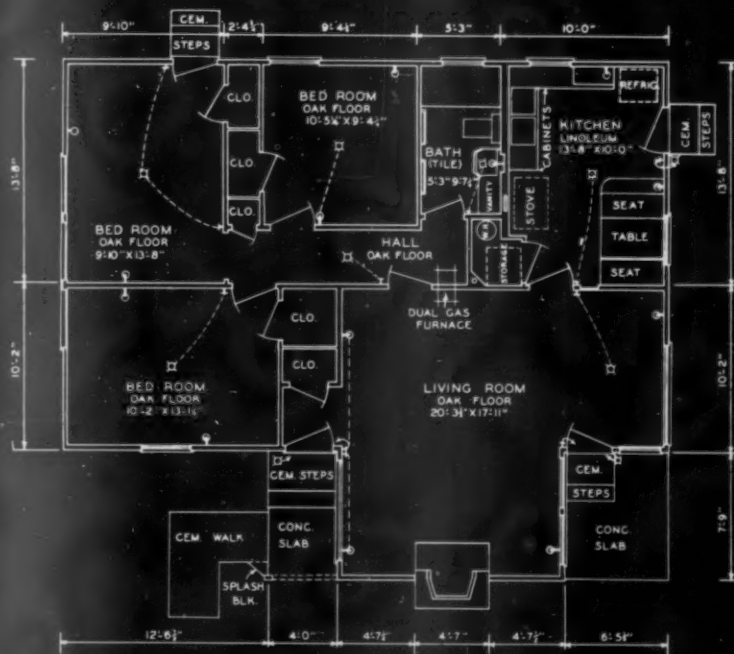
ELECTRIC WIRING It is the purpose of this specification to describe a complete electrical installation. All material shall be of standard make and of quality and installed as required by the National Board of Fire Underwriters. All outlets shall terminate in approved metal boxes. Switches shall be of toggle type. All outlets other than for lighting fixtures and switches shall be equipped with standard duplex connections. Wiring to outlets shall be of approved-size BX cable of sufficient size to carry the circuit load.

Each circuit shall be switched and fused and extended to a central panel board. This contractor shall terminate all circuits at an appropriate meter and fuse board.

Connection from meter panel to public service lines is not included in this contract, nor are electrical fixtures and appliances provided.



FOUNDATION PLAN



FLOOR PLAN

BUILDING COSTS OF A CALIFORNIA TYPE BUNGALOW BUILT IN SAINT LOUIS

Group C
(5) Millwork: Windows, doors, trim, kitchen cabinet, stairs.
Heating plant heating distribution-radiation.

(10) Nails and Hardware: Common and wire nails, bolts, damper, ash doors, finish hard-

work; general contractor's profit; and Missouri sales tax (now 2% on materials), old age and disability insurance, unemployment insurance, workers' compensation, liability and employees' compensation insurance, and unemployment tax (Federal and State).

GROUP A										GROUP B										GROUP C										GROUP D										E																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
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Ja 1946	228	477	85	113	387	174	549	417	512	183	83	14	216	193	15	9	66	75	69	37	96	131	75	2278	1826	1173	5277	43.5	5.32
Ap 1946	230	488	85	113	395	174	533	418	512	183	83	14	222	193	15	9	66	81	69	37	96	131	75	2278	1854	1183	5315	43.9	5.36
Ji 1946	236	505	85	113	395	188	549	435	518	202	89	14	240	193	16	9	77	81	71	39	96	131	81	2346	1917	1216	5479	45.2	5.52
O 1946	242	505	85	113	399	188	556	448	594	202	98	15	265	201	16	9	89	86	71	39	96	134	81	2488	1944	1269	5701	47.0	5.75
Ja 1947	283	645	101	144	481	298	800	542	755	237	110	17	319	266	44	10	83	95	99	83	114	160	95	3318	2391	1568	7275	60.0	7.33
Ap 1947	292	645	101	144	501	298	828	542	719	237	110	17	314	266	44	10	89	95	108	83	114	160	95	3349	2391	1573	7313	60.3	7.37
Ji 1947	295	645	101	144	500	298	763	542	719	237	110	17	321	266	47	10	88	95	108	77	114	160	95	3189	2391	1551	7131	58.8	7.19
O 1947	310	645	101	161	419	226	772	542	708	237	122	17	415	266	49	10	88	95	110	75	114	169	95	3338	2408	1611	7557	60.7	7.42
Ja 1948	317	679	127	161	439	237	783	541	776	240	130	19	359	298	53	10	83	95	115	81	119	169	101	3442	2500	1640	7582	62.6	7.69
Ap 1948	319	679	127	161	439	237	796	541	797	240	132	19	371	298	52	10	84	95	115	81	119	169	101	3482	2500	1650	7632	63.0	7.69
Ji 1948	323	720	127	165	439	254	796	597	825	261	132	19	383	298	52	10	84	104	115	81	121	169	107	3526	2666	1725	7917	65.3	7.88
O 1948	331	731	127	180	439	254	814	598	825	261	132	21	406	300	54	13	76	104	115	81	121	185	122	3585	2705	1754	8044	66.4	8.11
Ja 1949	337	731	127	180	417	254	801	598	1059	156	132	21	406	300	54	13	69	104	123	88	121	185	122	3798	2600	1663	8061	66.5	8.13
Ap 1949	337	740	120	182	414	237	787	592	1071	156	132	22	398	301	54	15	69	104	123	88	131	185	115	3778	2566	1774	8148	67.2	8.21
Ji 1949	357	740	120	182	369	254	746	592	1038	156	132	22	368	305	54	15	69	104	123	88	131	188	122	3630	2623	1750	7983	65.9	8.05
O 1949	357	740	120	182	380	254	749	592	1038	156	132	22	374	305	54	15	69	104	123	88	131	188	122	3652	2623	1738	8013	66.1	8.08
Ja 1950	337	740	120	182	380	254	749	592	1038	156	132	22	364	305	54	15	74	104	125	82	131	188	122	3643	2623	1736	8002	66.0	8.07
Ap 1950	338	740	119	182	369	254	792	592	1070	156	132	22	359	306	54	15	74	104	125	82	131	188	122	3702	2624	1743	8069	66.6	8.13
Ji 1950	345	774	128	182	401	260	823	618	1070	168	132	22	373	306	54	17	74	106	125	82	135	188	122	3795	2710	1796	8301	68.5	8.37
O 1950	350	774	126	182	465	260	895	618	1209	168	132	22	396	306	54	17	77	106	125	81	135	194	122	4104	2710	1849	8863	71.5	8.73
Ja 1951	364	797	126	202	442	283	876	644	1209	178	116	22	410	306	54	17	85	106	125	83	135	194	122	4084	2812	1888	8764	72.3	8.83
Ap 1951	411	797	126	198	465	283	888	644	1244	178	137	22	428	306	35	18	95	106	125	83	135	209	122	4246	2809	1905	8960	73.9	9.03
Ji 1951	411	797	126	198	426	283	859	644	1251	178	137	23	437	320	35	18	93	106	125	83	135	209	122	4192	2824	1905	8921	73.6	8.99
O 1951	383	849	126	212	426	307	860	692	1246	192	137	23	436	328	35	18	93	106	125	83	152	209	135	4159	3014	1963	9136	75.4	9.21
Ja 1952	383	849	126	212	426	307	817	692	1235	192	137	23	407	328	35	18	92	106	125	83	152	209	135	4075	3014	1963	9052	74.7	9.12
Ap 1952	383	849	126	215	414	307	824	692	1220	192	137	24	399	335	34	17	106	118	137	84	152	209	134	4073	3035	1965	9073	74.9	9.15
Ji 1952	383	849	120	215	415	307	806	692	1167	192	137	24	397	335	30	15	106	118	137	84	152	209	134	4001	3033	1955	8969	74.2	9.06
O 1952	383	849	121	221	415	307	806	692	1164	192	137	24	400	352	30	15	106	130	137	84	152	209	134	3982	3068	1969	9059	74.5	9.10
Ja 1953	383	866	121	221	415	310	806	692	1164	192	137	24	400	356	55	28	106	130	137	84	152	209	136	4017	3107	1982	9106	75.1	9.18
Ap 1953	386	866	121	221	440	310	806	692	1223	192	137	24	427	356	60	30	106	130	140	84	152	208	136	4140	3109	1994	9243	76.3	9.33
Ji 1953	388	866	121	221	440	310	811	692	1219	192	137	24	424	356	62	31	106	130	140	84	152	208	136	4140	3110	1993	9243	76.3	9.32
O 1953	390	866	123	234	423	310	836	692	1242	192	137	24	434	356	62	31	95	130	141	83	152	231	136	4197	3123	2006	9326	77.0	9.40
Ja 1954	399	866	122	234	415	310	835	692	1241	192	137	24	434	356	62	31	96	130	144	84	152	220	136	4189	3123	2016	9328	77.0	9.40
Ap 1954	399	866	122	234	402	310	835	711	1243	192	137	24	438	356	62	31	96	130	144	84	152	220	136	4182	3162	2039	9363	77.4	9.48
Ji 1954	399	866	123	234	402	310	837	711	1227	192	137	24	440	356	62	31	96	130	144	84	152	220	136	4171	3162	2038	9371	77.3	9.45
O 1954	400	866	122	238	424	310	831	711	1227	192	137	24	439	356	62	31	96	130	144	84	152	220	138	4186	3166	2043	9395	77.5	9.47
Ja 1955	407	892	122	238	424	310	832	711	1227	192	137	24	441	361	58	29	96	130	144	84	152	220	136	4192	3175	2047	9414	77.7	9.49
Ap 1955	410	892	122	227	436	302	836	708	1226	186	137	27	455	360	58	29	96	146	144	84	157	220	139	4224	3173	2052	9449	78.3	9.52

Architectural drawing of a house showing exterior elevations and dimensions. The drawing includes labels for 'SHINGLE ROOF (5'IN 12' PITCH)', 'BRICK CHIMNEY', 'DUTCH GUTTER', 'STUCCO', 'LEADER', 'FLOOR LINE', 'VENT', 'STEPS', and 'CONC. SLAB'. Dimensions are provided for various sections: 5'-6", 8'-1 1/2", 12'-6 1/2", 17'-10", 6'-5 1/2", and 8'-1 1/2".

SIDE ELEVATION

**"PERIMETER-AREA" METHOD OF ESTIMATING
CONSTRUCTION COSTS OF A
CALIFORNIA-TYPE BUNGALOW**

The reproduction cost of a California-type bungalow with specifications similar to the one discussed in the preceding pages, may be estimated by totaling the following three cost items:

1. Outside wall perimeter costs.
2. Fixed cost items.
3. Total interior floor area costs.

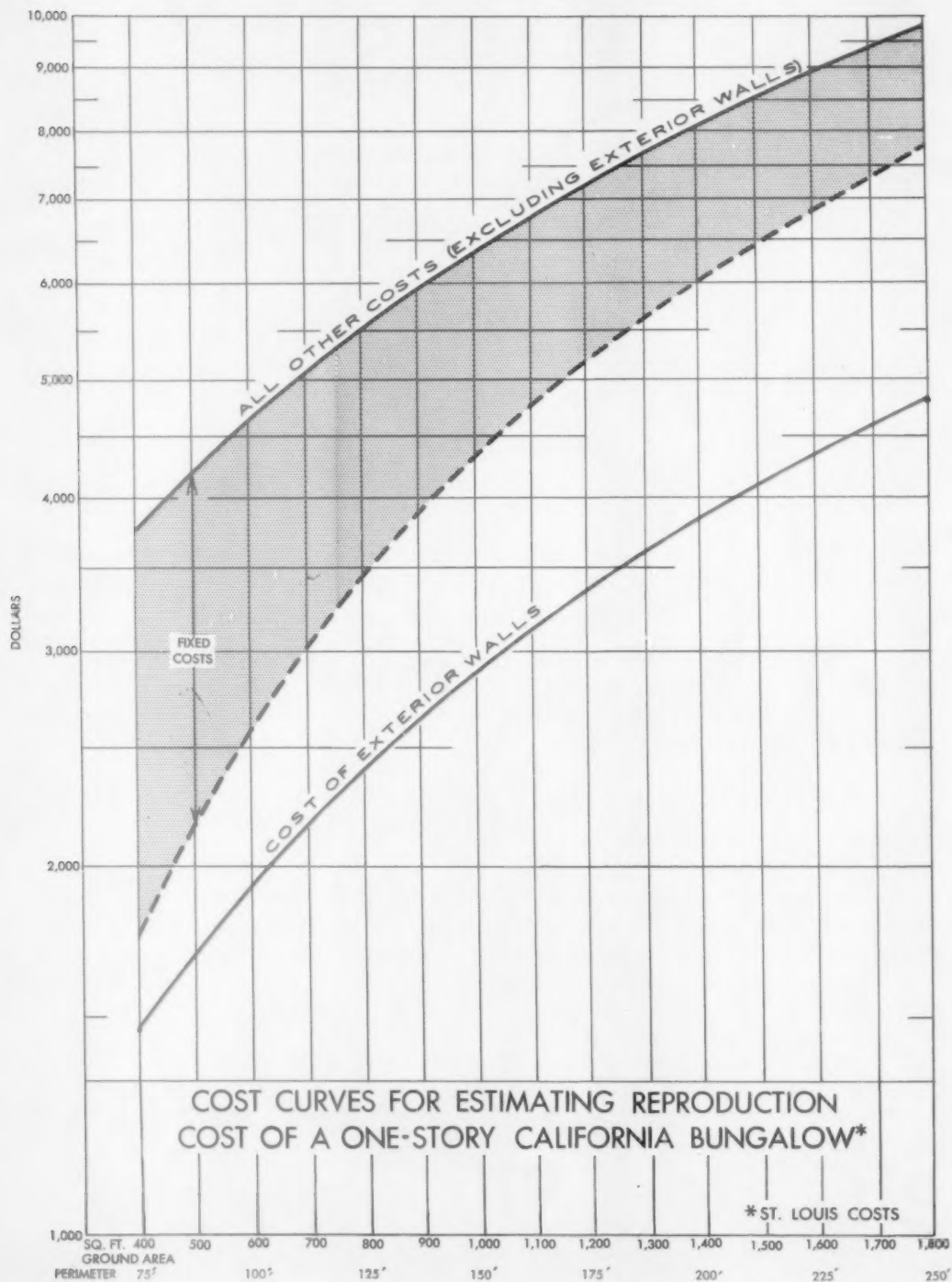
All outside wall perimeter costs are shown by the red line on the chart. This is done to take into account irregularly shaped houses or houses with large perimeters.

The fixed cost items consist of those items which will cost the same regardless of the size of the house. Included in this category are the costs of the fireplace and chimney, stairs, bathroom tile work, kitchen sink, plumbing fixtures, and medicine cabinet.

The remainder of the total cost of the house is based on the square feet of ground area covered, and is shown in combination with the fixed cost items by the solid blue line on the charts.

The chart on the back of this sheet is used in this manner. Assume a California-type bungalow with 175 feet of perimeter and 1,300 square feet of ground area. The red line shows that the perimeter cost would be \$3,350 and the solid blue line shows that all other costs in this house with 1,300 square feet of ground area would be \$7,700. The total cost, therefore, would be \$11,050.

For a house with more than 1,500 square feet of ground area, a 10% factor should be added for better workmanship. Also, these larger houses will have extra bathroom or lavatories. To the fixed costs add \$750 for an extra full bath and \$400 for an extra lavatory.



CONTEMPORARY FRAME RANCH

THE one-story frame house is undoubtedly the most popular house in the country, and has been for a long time. If there is any such thing as a basic house, it is probably a one-story frame. In the last 15 years, and particularly since the end of the war, the architectural and construction techniques applied to frame residences have brought forth widely varied results.

Probably the result that has pleased the greatest number of home buyers in the postwar period is the basementless house with the open floor plan and sweeping roof line. Dry wall construction is another characteristic frequently found in this type of house. More often than not, these houses are built as semi-prefabs and in numbers sufficient to allow the application of other mass production techniques. One very widely publicized house of this type is the Home Builders' "Trade Secrets Home," recently featured in LIFE and HOUSE AND HOME Magazines.

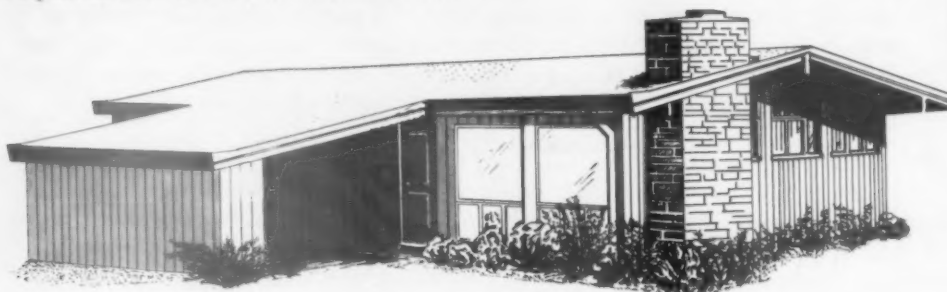
The house discussed in this bulletin is usually built in volume and as a semi-prefab. It was designed by Ralph Fournier of Modular Homes, Inc., and Burton W. Duenke of the Burton W. Duenke Building Company. Most of these houses have been erected by Duenke. A good portion of the house is prefabricated by Modular Homes, Inc., which delivers the "packaged" houses to Duenke for erection in one of his several subdivisions. This house was chosen as a Five-Star Home by BETTER HOMES AND GARDENS, and its pictures and floor plans appeared in a recent article in that magazine.

The costs shown here by no means represent the usual selling price of this type house. There are numerous items usually included by the builder in his package that we have omitted. We have done this for two reasons:

1. In order to make the construction costs of this house comparable with the costs of other Wenzlick Standard Houses, we have omitted such items as stoves, refrigerators, washers and other appliances. Neither do we include such items as Venetian blinds and lighting fixtures. These items are, for the most part, not really items of construction cost, and have never been included in the costs of the other Wenzlick Standard Houses.

2. There are many items that vary widely in cost, not only from one part of the country to another, but within the same area. Moreover, some of these items can hardly be considered as items of construction cost of the house. In this class are the lot, landscaping, grading, planting, sodding, walks, drives, curbs, sewers, streets and other subdivision costs, surveys, architect's fees and sales commissions. We have, therefore, omitted from our estimate these items that vary widely in cost, or which are not strictly construction cost items.

Modular Homes, Inc., of St. Louis County, has furnished us with the plans and specifications of the house. Since our cost estimates are based on conventional construction, we have altered the specifications (slightly) to meet the requirements of a conventional builder.



FRAME RANCH HOUSE

Content: 12,285 cubic feet
1,170 square feet

DESCRIPTIVE SPECIFICATIONS

EXCAVATION

Excavation for foundation wall and grade beam should be to a minimum of 30". Where excavation does not reach virgin clay, piers 6' 4" on center should be dug to solid ground (no piers included in cost figures).

FOUNDATION WALLS

Foundation walls shall be installed to dimensions indicated on the plans. The mixture shall be one (1) part Portland Cement, two (2) parts clean sharp sand, four (4) parts broken stone, trap-rock, gravel or other suitable clean coarse aggregate, graded in size to pass through a 2" screen. The foundation may be done in two pours, the first up to grade level, and the second to complete the wall as shown in the drawings. The two pours should be tied together with 5/8" rods, as necessary. Bolts to hold plates should be $\frac{1}{2}$ " x 10", and set about 6" on center. Plates should be set in asphalt plastic cement to provide a weather seal and termite protection. Grade beam should be poured as shown on drawings.

FLOOR SLAB

The floor slab is 4" concrete 1-2-4 mixture with a trowel finish and with 6 x 6 x 10 reinforcing mesh. The fill under the slab is 6" of gravel, and the under-slab waterproofing is Sisalkraft. Two-inch glass insulation bats, 30" long, are laid beneath perimeter of the floor slab as shown on drawings.

Furnace chimney base is precast perlite and flue is 8" round terra cotta. It is held in place by reinforcing rods which go through the rafters.

FIREPLACE

The fireplace is built of stone and lined with firebrick. The chimney is built of concrete block and faced with stone veneer. The chimney flue liner is to be 10" terra cotta. A 30" steel damper is to be installed.

ROUGH CARPENTRY AND FRAMING MATERIAL

Rough carpentry and framing material shall be the best grade provided in local practice (may be yellow pine, white pine, fir or hemlock). All material shall be of sizes indicated, with allowance for milling.

Studding in exterior walls and
interior partitions 2" x 4" - spaced 16" c to c
Roof rafters 2" x 8" - spaced 16" c to c
Joists 2" x 8" - spaced 16" c to c

The entire structure shall be braced and trussed where necessary, and securely nailed as required by best practice.

SHEATHING

Sheathing on roof and exterior walls shall be No. 2, yellow pine or fir or equal, dressed 6" to 8" wide. It shall be laid diagonally on the exterior walls, and each intersection well nailed by two 6d nails.

EXTERIOR SIDING

Exterior siding is V-joint redwood 7/8" thick and from 8" to 12" wide. Siding is nailed with an extra long tongue to assure tight joints.

ROOFING

Roof has a pitch of 2" in 12". Redwood is used on all overhanging areas, and yellow pine, fir, white pine or hemlock is used on the remainder of the roof. Built-up asphalt and gravel roof consists of one 30-pound and two 15-pound felts, solid mopped to each other and spot mopped to the roof deck. After the final mopping, the entire surface is covered with roofing stone or gravel. The flashing material is to be 26-gauge galvanized iron.

GUTTERS AND DOWNSPOUTS

Gutters are built in as part of the roof, as shown in the plans. Spouting headers and downspouts are 3" x 4" rectangular shaped, and are to be made from 26-gauge galvanized iron.

DOORS, WINDOWS AND MILLWORK

Interior doors are to be slab-type, 1-3/8" thick, with a birch finish. The main entrance door is to be slab-type, 1-3/4" thick, with a birch finish. The rear entrance door is single panel, of 1-3/4" white ponderosa pine. All door jambs and door frames are redwood. Trim is to be box-type, 1/2" x 2" striated redwood. Window frames are redwood, and the sliding windows are aluminum. Windows are set in calking. The small fixed glass windows are to be double-strength, and the large fixed glass windows are crystal sheet. Window trim is also box-type, 1/2" x 2" striated redwood. Full screens are to be provided for the aluminum sliding windows. All exterior millwork is redwood.

FINISHED FLOORS

Finished floors are 1/8" asphalt tile in all rooms.

BUILT-IN CABINETS

Kitchen cabinets are of natural finish birch. There are to be 30 lineal feet of shelves, 13" wide. Counter top of kitchen cabinets is formica, and there is to be an 18" formica back splash. The medicine cabinet is to be made of steel, with a plate glass mirror, and shelves are to be installed in the linen closet. Book shelves and telephone cabinet are mill made. The storage wall closets are equipped with sliding doors.

TILE WORK

Ceramic tile (4-1/4" x 4-1/4") wainscoting is to be provided in the bathroom. The tile is to be set in mastic to a height of 45 1/2" except above the tub. The height above the tub is to be 60".

INTERIOR WALLS AND CEILINGS

Interior walls and ceilings are to be covered with dry wall material 1/2" thick. The joints are to be given the standard three-coat cement and tape treatment, and thoroughly sanded.

PAINTING

Immediately upon completion of all exterior and interior woodwork, and exterior siding, the painter shall apply priming coat consisting of white lead, pure linseed oil and turpentine, blended in proportions considered best in local practice. Upon completion of the priming coat, all nail holes and other imperfections in the wood shall be stopped and filled with white lead putty. Second and third coats shall also consist of white lead, pure linseed oil and turpentine, and may be mixed and applied in the color selected. Interior walls and ceilings are to be given one coat of a sand-finish rubber-base paint, the colors to be selected by the owner.

PLUMBING

This specification contemplates a complete plumbing, drainage and water-supply system for one bathroom and one kitchen, and lead-in and drainage lines for the installation of a water heater and washing machine.

Sewer Line, Vents and Drainage. House sewer line of 4" shall be carried to a point 50' beyond foundation walls. Septic tank, drainage field, a connection to public sewer or municipal permits as may be required by local custom are not included. Vent and drainage system shall be installed and tested in accordance with best local practice, municipal code, or requirements of American Society of Sanitary Engineers. All joints shall be filled with oakum and poured lead and well calked. Two-inch vent and waste lines shall be continued beyond the foundation walls for 50' and the joints securely set with cement mortar. Plumber shall excavate and backfill all pipe trenches.

Water Supply. A pipe shall be continued 50' beyond the foundation walls in separate trench. This shall be laid using 3/4" copper water tubing with sweat-joint fittings. One-half inch copper tubing with sweat-joint pipe and fitting shall be installed for hot and cold water supply and connected with all plumbing fixtures.

All pipe and fitting shall be installed in accordance with manufacturer's instructions.

Fixtures. There shall be furnished and installed to the rough connections here provided fixtures of quality equal to those specified in the following list:

- 1 single bowl kitchen sink set in formica top
- 1 lavatory with formica top and metal base cabinet for the bath
- 1 vitreous china water closet
- 1 bathtub equipped with shower and standard rod

Hot Water Supply. A domestic heater is not provided under these specifications. It will be provided under separate order on selection by the owner, and cost of connecting and placing the device in operation shall be included under this original plumbing contract.

Alternates. If local building codes and practice do not permit the use of copper tubing and sweat-joint fittings for water supply, the contractor shall furnish genuine wrought-iron galvanized pipe in place thereof. However, where substitution is made, pipe one size larger than specified shall be provided.

HEATING PLANT

The contractor shall guarantee the heating plant to heat the entire house to 70° Fahrenheit when the outside temperature is at zero, and the wind velocity is not in excess of 30 miles an hour, with not less than a 6-hour firing period. It is recommended that a furnace with 90,000 B.T.U. input be installed, and that it shall be a forced warm air furnace manufactured by the American Furnace Company or equal. Heating ducts are to be 26-gauge galvanized iron.

ELECTRICAL SYSTEM

110-volt and 220-volt lines shall be run to the house. There are to be four 110-volt circuits. All material shall be of standard make and of quality and installed as required by the National Board of Fire Underwriters. All outlets shall terminate in approved metal boxes, and switches shall be of toggle type. All outlets other than for lighting fixtures and switches shall be equipped with standard duplex connections. Wiring to outlets shall be of approved size BX or Romex cable of sufficient size to carry the circuit load. Each of the four circuits shall be switched and fused and extended to a central panel board, and shall terminate at an appropriate meter and fuse box. Connection from meter panel to public service lines is not included in this contract, nor are electrical fixtures and appliances provided.

INSULATION

4" of loose insulating material, rock wool or equal, shall cover the entire area of the ceiling. All exterior walls shall be insulated with 4" bats, rock wool or equal.

CARPORT

Carport framing shall be similar to that of the house. The storage space is to be unfinished inside, but is equipped with four batten doors.

BUILDING COSTS OF A FRAME RANCH HOUSE BUILT IN ST. LOUIS (WITH PLASTERED WALLS)

Costs are grouped into four classifications of material, four of labor, and one of overhead. A further breakdown of these groups is given in detail below. Columns of the table are numbered, and a brief description of the items included in each is given in the paragraphs following. Paragraphs are numbered to correspond with the items in the table. Building material costs are indicated by the letter M; corresponding labor items are indicated by the letter L. No labor items are shown in Column 10, Building Hardware, as they have already been included in Column 5, Millwork.

Group A
(1) Masonry: Cement, sand, gravel, plastering materials, stone, fire brick, flue lining.
(2) Lumber: 4-1/4 x 4-1/4 wall tile, ceramic floor tile, cap and base.

Group B
(3) Unfinished Lumber: Joists, rafters, interior and exterior studs, bracing, etc.
(4) Finished Lumber: Sheathing, ceiling, roofing materials, etc.

Group C
(5) Millwork: Windows, doors, trim, kitchen cabinets, storage walls, etc.

Group D
(6) Heating: Ceiling-type forced warm air furnace, gas or oil fired, with necessary duct work and controls.

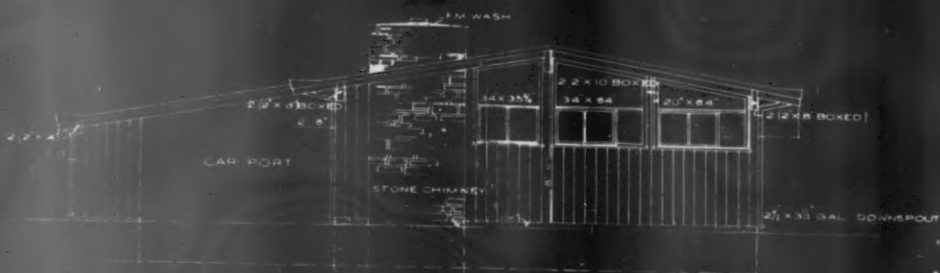
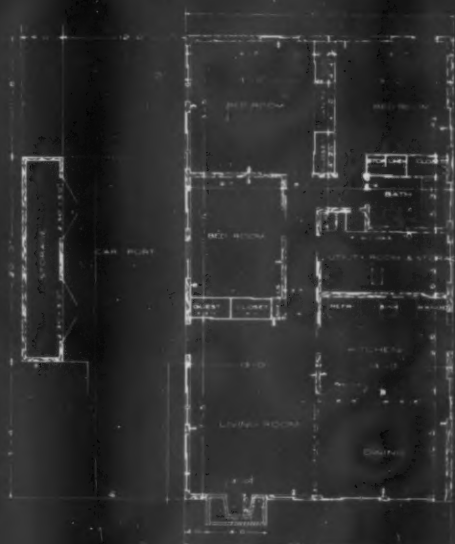
Group E
(7) Plumbing: Hot pipes and connections, stack, water pipe and connections, lead, oakum and bathroom fixtures, kitchen sink; water heater and tank to be furnished by owner.

Group F
(8) Sheet Metal: Gutters are built as part of roof. Sheet metal includes rectangular shaped downspouts, 26-gauge galvanized iron; copper flashing around chimney.
(9) Electrical Work: Main switch, BX cable, switch boxes, receptacles, transformer, no fixtures included.
(10) Paint and varnish: Common and wire nails, bolts, damper, finish hardware, etc.
(11) Plaster and masonry: Common and wire nails, bolts, damper, finish hardware, etc.
(12) Miscellaneous: Lath, corner bead, insulation.

Group G
(13) Total overhead, profit and other costs. This item includes overhead and profit of subcontractors in plastering, masonry work, heating, plumbing, electrical work and tile work; general contractor's profit; and Missouri sales tax (now 5% on materials), old age and unemployment tax (Federal and State), liability and employees' compensation insurance, fire and tornado insurance, and completion bond.

	GROUP A				GROUP B				GROUP C				GROUP D				GROUP E				WITH FULL BASEMENT			
	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	Total	Cu. ft.	Sq. ft.	Cost
Ja 1946	715	447	855	59	642	941	1,182	816	921	921	921	921	55	55	55	55	55	55	55	55	12,300	54.6	9.84	12,300
Ap 1946	722	477	855	59	642	941	1,182	816	921	921	921	921	55	55	55	55	55	55	55	55	12,300	54.6	9.84	12,300
Ja 1946	722	477	855	59	642	941	1,182	816	921	921	921	921	55	55	55	55	55	55	55	55	12,300	54.6	9.84	12,300
O 1946	722	477	855	59	642	941	1,182	816	921	921	921	921	55	55	55	55	55	55	55	55	12,300	54.6	9.84	12,300
Ja 1947	722	477	855	59	642	941	1,182	816	921	921	921	921	55	55	55	55	55	55	55	55	12,300	54.6	9.84	12,300
Ap 1947	722	477	855	59	642	941	1,182	816	921	921	921	921	55	55	55	55	55	55	55	55	12,300	54.6	9.84	12,300
O 1947	722	477	855	59	642	941	1,182	816	921	921	921	921	55	55	55	55	55	55	55	55	12,300	54.6	9.84	12,300
Ja 1948	897	640	81	90	570	488	983	809	1,359	951	384	21	363	335	26	5	80	89	90	85	12,300	54.6	9.84	12,300
Ap 1948	897	640	81	90	570	488	983	809	1,359	951	384	21	363	335	26	5	80	89	90	85	12,300	54.6	9.84	12,300
O 1948	897	640	81	90	570	488	983	809	1,359	951	384	21	363	335	26	5	80	89	90	85	12,300	54.6	9.84	12,300
Ja 1949	900	681	81	100	547	535	964	544	1,653	514	288	23	410	337	23	7	86	97	104	106	12,300	54.6	9.84	12,300
Ap 1949	900	681	81	100	547	535	964	544	1,653	514	288	23	410	337	23	7	86	97	104	106	12,300	54.6	9.84	12,300
O 1949	900	681	81	100	547	535	964	544	1,653	514	288	23	410	337	23	7	86	97	104	106	12,300	54.6	9.84	12,300
Ja 1950	900	681	81	100	547	535	964	544	1,653	514	288	23	410	337	23	7	86	97	104	106	12,300	54.6	9.84	12,300
Ap 1950	900	681	81	100	547	535	964	544	1,653	514	288	23	410	337	23	7	86	97	104	106	12,300	54.6	9.84	12,300
O 1950	900	681	81	100	547	535	964	544	1,653	514	288	23	410	337	23	7	86	97	104	106	12,300	54.6	9.84	12,300
Ja 1951	900	681	81	100	547	535	964	544	1,653	514	288	23	410	337	23	7	86	97	104	106	12,300	54.6	9.84	12,300
Ap 1951	900	681	81	100	547	535	964	544	1,653	514	288	23	410	337	23	7	86	97	104	106	12,300	54.6	9.84	12,300
O 1951	900	681	81	100	547	535	964	544	1,653	514	288	23	410	337	23	7	86	97	104	106	12,300	54.6	9.84	12,300
Ja 1952	900	681	81	100	547	535	964	544	1,653	514	288	23	410	337	23	7	86	97	104	106	12,300	54.6	9.84	12,300
Ap 1952	900	681	81	100	547	535	964	544	1,653	514	288	23	410	337	23	7	86	97	104	106	12,300	54.6	9.84	12,300
O 1952	900	681	81	100	547	535	964	544	1,653	514	288	23	410	337	23	7	86	97	104	106	12,300	54.6	9.84	12,300
Ja 1953	900	681	81	100	547	535	964	544	1,653	514	288	23	410	337	23	7	86	97	104	106	12,300	54.6	9.84	12,300
Ap 1953	900	681	81	100	547	535	964	544	1,653	514	288	23	410	337	23	7	86	97	104	106	12,300	54.6	9.84	12,300
O 1953	900	681	81	100	547	535	964	544	1,653	514	288	23	410	337	23	7	86	97	104	106	12,300	54.6	9.84	12,300
Ja 1954	900	681	81	100	547	535	964	544	1,653	514	288	23	410	337	23	7	86	97	104	106	12,300	54.6	9.84	12,300
Ap 1954	900	681	81	100	547	535	964	544	1,653	514	288	23	410	337	23	7	86	97	104	106	12,300	54.6	9.84	12,300
O 1954	900	681	81	100	547	535	964	544	1,653	514	288	23	410	337	23	7	86	97	104	106	12,300	54.6	9.84	12,300
Ja 1955	900	681	81	100	547	535	964	544	1,653	514	288	23	410	337	23	7	86	97	104	106	12,300	54.6	9.84	12,300
Ap 1955	900	681	81	100	547	535	964	544	1,653	514	288	23	410	337	23	7	86	97	104	106	12,300	54.6	9.84	12,300
O 1955	900	681	81	100	547	535	964	544	1,653	514	288	23	410	337	23	7	86	97	104	106	12,300	54.6	9.84	12,300

*Add between \$500 and \$800 for carpet.



"PERIMETER-AREA" METHOD OF ESTIMATING CONSTRUCTION COSTS OF A CONTEMPORARY FRAME RANCH HOUSE

The reproduction cost of a frame ranch house with specifications similar to the one discussed in the preceding pages, may be estimated by totaling the following three cost items:

1. Outside wall perimeter costs.
2. Fixed cost items.
3. Total interior floor area costs.

All outside wall perimeter costs are shown by the red line on the chart. This is done to take into account irregularly shaped houses or houses with large perimeters.

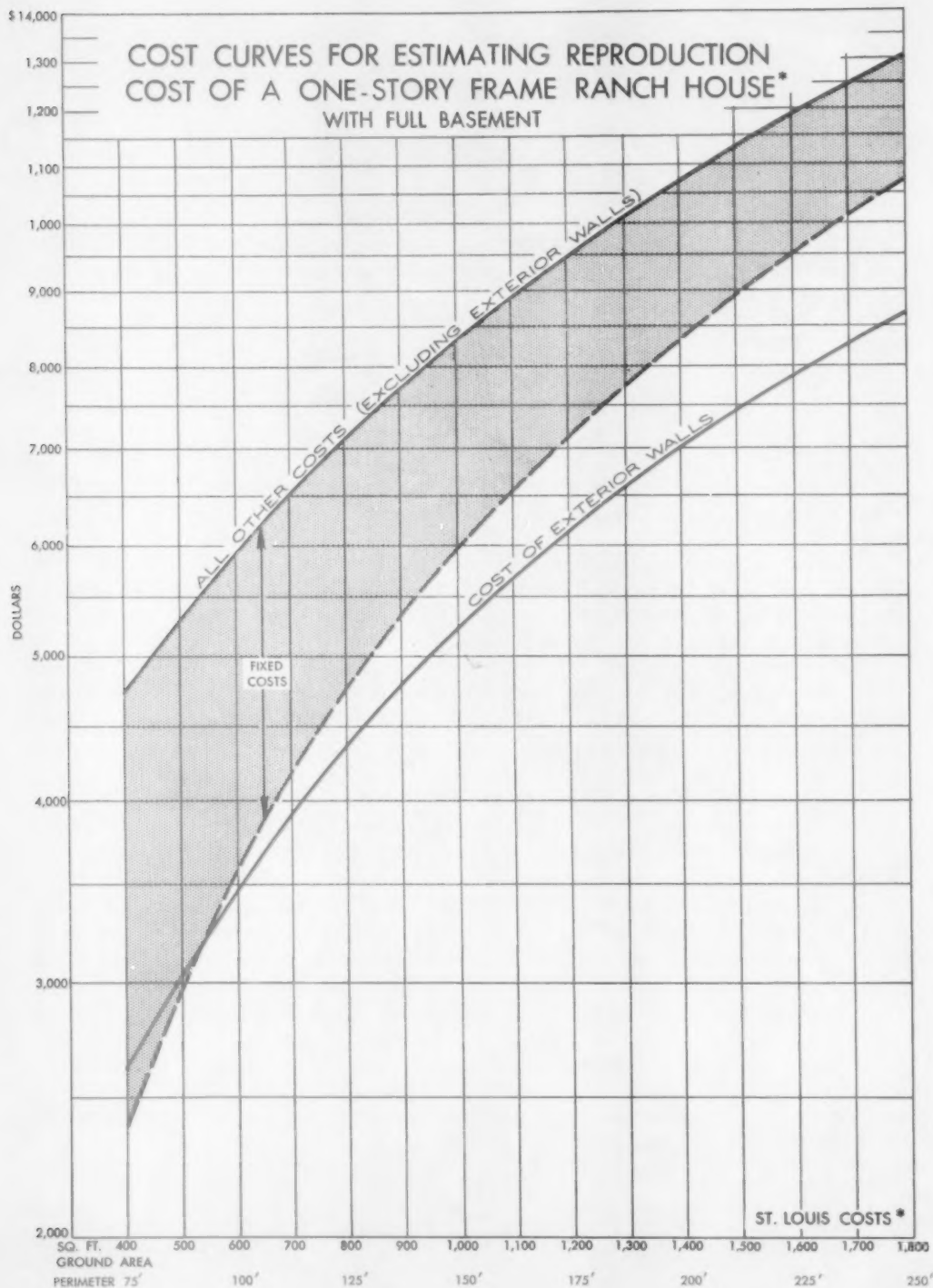
The fixed cost items consist of those items which will cost the same regardless of the size of the house. Included in this category are the costs of the fireplace and chimney, stairs, bathroom tile work, kitchen sink, plumbing fixtures, and medicine cabinet.

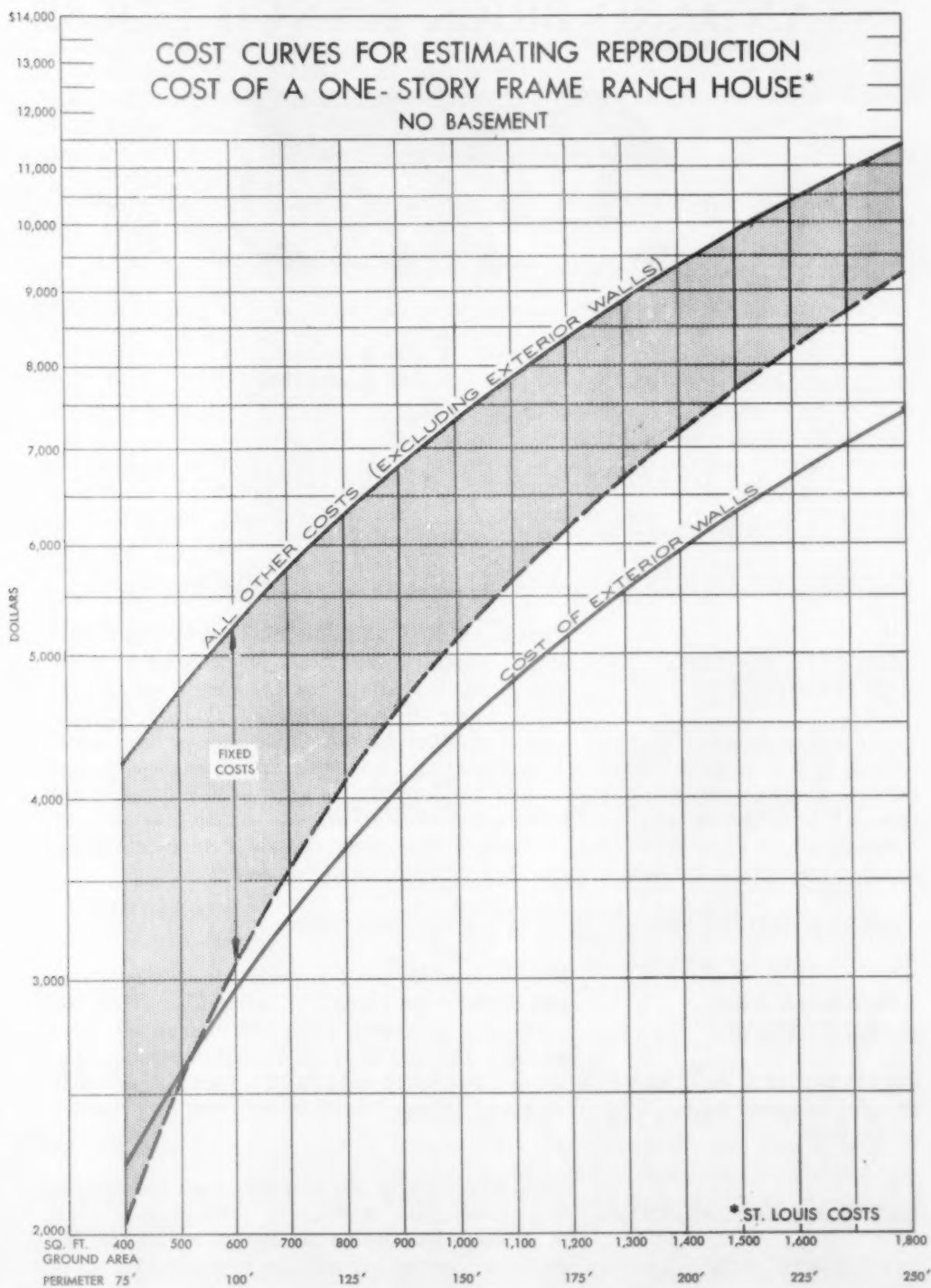
The remainder of the total cost of the house is based on the square feet of ground area covered, and is shown in combination with the fixed cost items by the solid blue line on the charts.

There are two charts for the frame ranch house. The first shows the cost curves for estimating the cost of a frame ranch house with a basement, while the second shows the cost curves for a frame ranch house without a basement.

The charts following are used in this manner. Assume a frame ranch house with full basement with 150 feet of perimeter and 1,200 square feet of ground area. The red line shows that the perimeter cost would be \$5,000, and the solid blue line shows that all other costs in this house with 1,200 square feet of ground area would be \$9,500. The total cost, therefore, would be \$14,500.

For a house with more than 1,500 square feet of ground area, a 10% factor should be added for better workmanship. Also, these larger houses will have extra bathroom or lavatories. To the fixed costs add \$750 for an extra full bath and \$400 for an extra lavatory.





STANDARD BRICK RANCH HOUSE



Content: 16,250 cubic feet
840 square feet

DESCRIPTIVE SPECIFICATIONS

GENERAL CONDITIONS - Same as 6-room frame house.

PREPARATION OF SITE AND EXCAVATION - Same as 6-room frame house.

CONCRETE FOOTINGS AND FOUNDATIONS

Foundation walls shall be installed to a thickness of 8". Footings are to be 1' 4" wide by 8" thick. The mixture shall be one (1) part Portland Cement, three (3) parts clean sharp sand, five (5) parts broken stone, trap-rock, gravel or other suitable clean coarse aggregate, graded in size to pass through a 2-inch screen, adequately mixed with a sufficient amount of clean water in a mechanical batch mixer, placed in the forms within one-half hour thereafter. Ready-mix concrete of these proportions may be used. Substantial and tight forms shall be built on both inner and outer surface foundations of the walls. No part of excavated material shall be used as a form.

FINISHED CEMENT WORK - Same as 6-room frame house.

BRICKWORK AND MASONRY ITEMS

The contractor shall provide all brickwork as specified on the plans. The brick shall be laid in running bond with each fifth course a header course, and laid in cement mortar composed of one (1) part bulk lime, three (3) parts clean sharp sand to which may be added 10 percent hydrated lime. A "metalbestos" chimney shall be provided as indicated on the plans.

LATHING AND PLASTERING

All interior walls and ceilings shall be covered with three coats of plaster. The plaster shall be applied directly to the inside surface of the exterior brick walls. Interior partitions and ceiling shall be covered with three

coats of plaster over rock lath (or expanded metal lath) secured to studs (or joists) at each intersection with blued lath nails. Corner beads shall be provided for all exterior angles. The scratch coat shall be one (1) part lime putty to three (3) parts sand. The finished coat shall be dry gauged plaster to two (2) parts dry hydrated lime. First grade workmanship is required in the application of each plaster coat. No cornice or ornamental plaster work is contemplated under this contract.

Where tile walls occur in the bathroom and kitchen, the contractor shall cover with metal lath and cement mortar scratch.

INSULATION Four inches of loose insulating material, rock wool or equal, shall cover entire area of the ceiling.

TILING This specification provides for tiling the bathroom floor and walls, and kitchen wainscot. The floor shall be prepared by the carpenter and mason, and the walls by plastering contractor as specified above. The tile setter shall furnish and install 4-1/4" x 4-1/4" glazed commercial-grade wall tile with approved caps, bases, angles, etc., color to be selected by owner. Tile to be installed to a height of 3' 6" in the kitchen and bathroom and to ceiling of the bathroom around the tub. The bathroom floor shall be 1" or 2" hexagonal white ceramic tile. The contractor shall furnish all setting materials and on completion leave the entire work properly grouted and cleaned.

ROUGH CARPENTRY AND FRAMING MATERIAL Rough carpentry and framing material shall be the best grade provided in local practice. It may be yellow pine, white pine, fir or hemlock. All materials shall be of sizes indicated, with allowance for milling. All joists, studs and rafters shall be spaced 16 inches c to c, and one line of cross bridging shall be provided for each floor span exceeding 10 feet.

UNDERFLOORING AND SHEATHING Sheathing on roof and all subflooring shall be provided as indicated. Material shall be No. 2 dressed and not over 6 inches wide, laid diagonally for floors and each intersection well secured by two 6d nails.

ROOFING The roof shall be asphalt 3-in-1 shingles weighing not less than 210 lbs. per square.

PAPER AND FELT Before placing asphalt shingles, the roof surface shall be covered with one course of approved waterproof building felt, weighing not less than 15 lbs. per square, materials to be well nailed and lapped at least 2" at all edges.

Before placing the finished flooring, all subflooring shall be covered with one course of building paper.

FLASHING - SHEET METAL WORK - Same as 6-room frame house.

MILLWORK - INTERIOR - Same as 6-room frame house.

FINISHED FLOORS Finished floors shall be of clear select red oak, 2-1/4" x 13/16", to be placed over all the floor area except in the bath. The flooring shall be laid tight and even and nailed every 26 inches. All flooring shall be scraped or sanded and completed ready for the painters.

BUILT-IN CABINETS Built-in kitchen cabinets shall be provided as indicated on the plans.

BASEMENT STAIRS Basement stairs shall be finished and erected as indicated on the plans. This stairway, including stringers, treads and rails, shall be of No. 1 yellow pine.

PAINTING This contract does not contemplate the painting or decorating of the plastered walls and ceilings. All exterior woodwork shall receive a prime coat consisting of white lead, pure linseed oil and turpentine in the proportions considered best in local practice, or one (1) coat of ready-mixed primer as selected by the owner. Upon completion of the priming coat, all nail holes and all other imperfections in the work shall be stopped and filled with white lead putty. Second and third coats shall be mixed and applied in the color selected. All interior woodwork with the exception of the doors is to receive one (1) prime coat and two (2) coats of semi-gloss enamel in a color to be selected by the owner. The painter shall oil stain and varnish all doors, each interior door to receive two (2) coats of varnish, and the exterior doors to receive three (3) coats of varnish. The painter shall also oil stain oak floors in the shade selected and fill with an approved paste filler. The floors shall then be finished with three (3) coats of white shellac.

PLUMBING Same as 6-room frame house, except no lavatory is provided in the specifications. The specifications cover the installation of three (3) bathroom fixtures and a kitchen sink.

HEATING PLANT The contractor shall install one (1) forced circulation, combination furnace (24 inches) and blower with automatic humidifier, complete with necessary leads and returns made of 26-gauge galvanized steel. The contractor shall guarantee the heating plant to heat the entire living quarters of the house to 70 degrees Fahrenheit when the outside temperature is at Zero Fahrenheit and the wind velocity not in excess of 30 miles per hour, with not less than a 6-hour firing period. The furnace is to be fired by an oil or gas burner as selected by the owner.

ELECTRIC WIRING - Same as 6-room frame house.



BUILDING COSTS OF A STANDARD BRICK RANCH HOUSE BUILT IN ST. LOUIS

Costs are grouped into four classifications of material, four of labor, and one of overhead. Further breakdown of these groups is given in detail below. Columns of the table are numbered in the order of the items included in each is given in the paragraphs below. Paragraphs are numbered by the letter M; corresponding labor items by the letter L. No labor items are shown in Column 10. Building Hardware, as they have already been included in Column 5, Millwork.

Group A
(1) Masonry: Cement, sand, gravel, plastering materials, face and common brick, and miscellaneous chimney.
(2) The Work: 4-1/4 x 4-1/4 wall tile, ceramic floor tile, base and cap.
Group B
(3) Unlabeled Lumber: Columns, beams, floor and ceiling joists, interior studs, rafters, bracing, etc.
(4) Finished Lumber: Subflooring, finished floors, asphalt shingle roof and roofing materials.
(5) Millwork: Windows, doors, trim, kitchen cabinets.

	GROUP A										GROUP B										GROUP C										GROUP D										GROUP E WITH FULL BASEMENT										NO BASEMENT																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
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"PERIMETER-AREA" METHOD OF ESTIMATING CONSTRUCTION COSTS OF A STANDARD BRICK RANCH HOUSE

The reproduction cost of a brick ranch house with specifications similar to the one discussed in the preceding pages, may be estimated by totaling the following three cost items:

1. Outside wall perimeter costs.
2. Fixed cost items.
3. Total interior floor area costs.

All outside wall perimeter costs are shown by the red line on the chart. This is done to take into account irregularly shaped houses or houses with large perimeters.

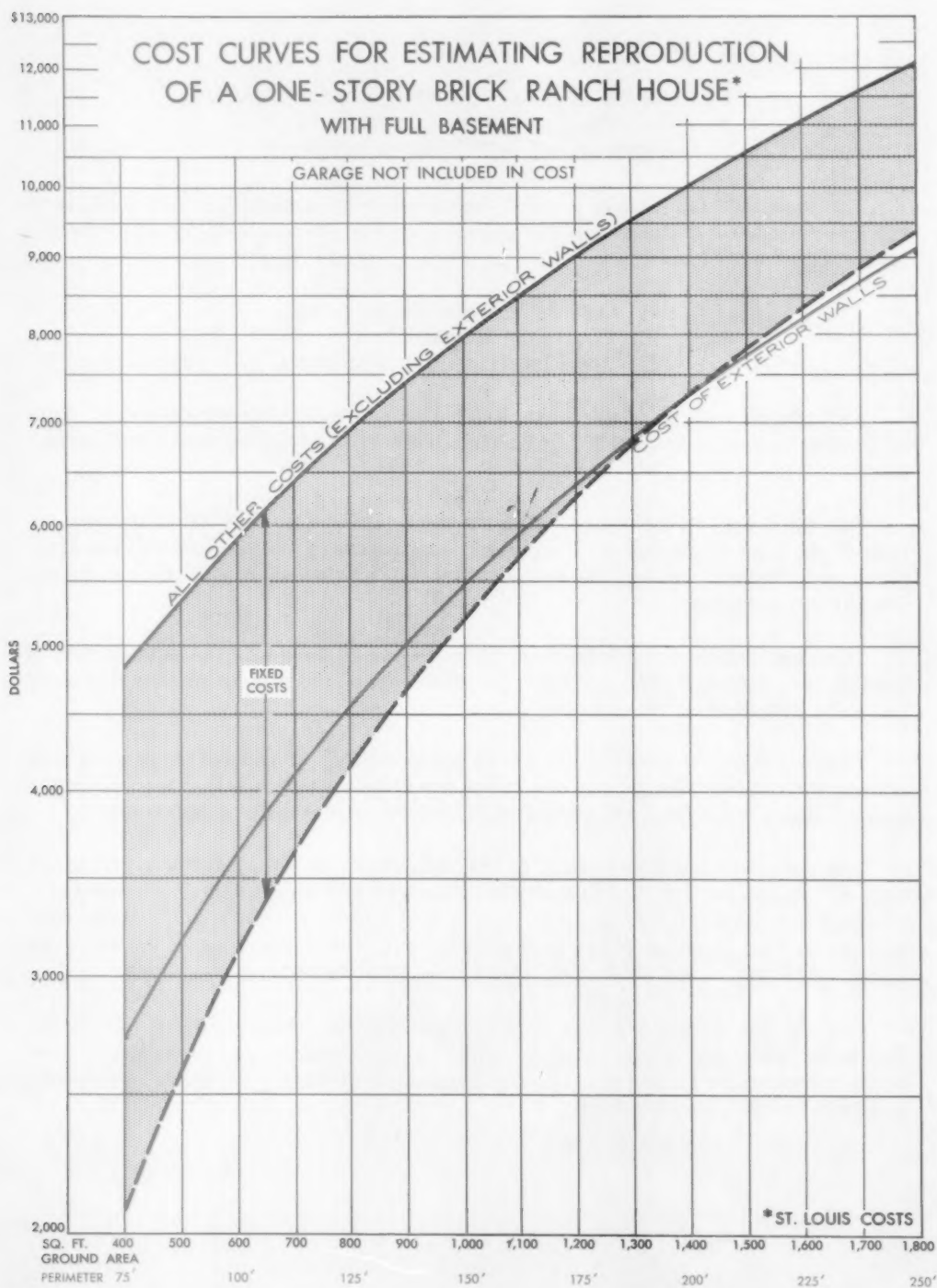
The fixed cost items consist of those items which will cost the same regardless of the size of the house. Included in this category are the costs of the fireplace and chimney, stairs, bathroom tile work, kitchen sink, plumbing fixtures, and medicine cabinet.

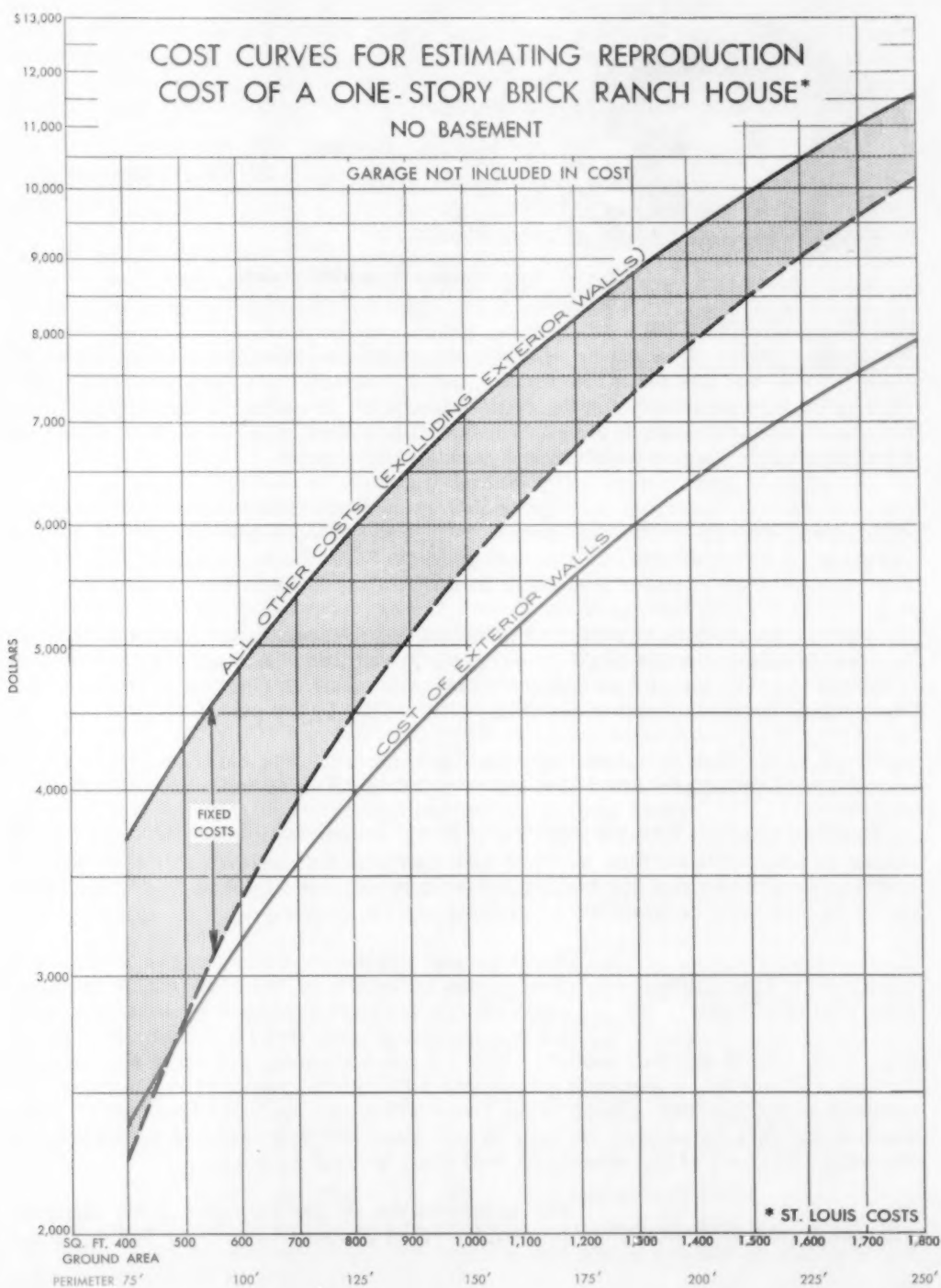
The remainder of the total cost of the house is based on the square feet of ground area covered, and is shown in combination with the fixed cost items by the solid blue line on the charts.

There are two charts for the brick ranch house. The first shows the cost curves for estimating the cost of a brick ranch house with a basement, while the second shows the cost curves for a brick ranch house without a basement.

The charts following are used in this manner. Assume a brick ranch house with full basement with 120 feet of perimeter and 875 square feet of ground area. The red line shows that the perimeter cost would be \$4,300 and the solid blue line shows that all other costs in this house with 875 square feet of ground area would be \$7,300. The total cost, therefore, would be \$11,600.

For a house with more than 1,200 square feet of ground area, a 10% factor should be added for better workmanship. Also, these larger houses will have extra bathroom or lavatories. To the fixed costs add \$750 for an extra full bath and \$400 for an extra lavatory.





EIGHTEEN-FAMILY APARTMENT



Content: 168,385 cubic feet
13,260 square feet

DESCRIPTIVE SPECIFICATIONS

GENERAL CONDITIONS

Materials, Labor, Appliances. Unless otherwise specified herein, the contractor shall provide and pay for all materials, labor, water, tools, equipment, permits, light and power necessary for the completion of the Wenzlick 18-family apartment. Unless otherwise specified, all materials shall be sound, new and of good quality and all work shall be done in a skillful and workmanlike manner.

PREPARATION OF SITE AND EXCAVATION

The contractor shall clear the site of all trees, brush, etc., which come within the area of the proposed building. He shall carefully remove and stack on the plot the top soil for making the lawn.

Excavation shall be of sufficient area and depth to accommodate the building indicated; foundation walls shall be carefully backfilled. Any surplus material not required to grade the plot as designated by plans shall be removed from the premises. Any shortage of materials shall be furnished by the contractor.

Rock excavation is not included in this contract. The contractor will be paid an additional price per cubic foot for rock removal as specified in his bid.

Pumping of other than surface water is not included in the contract price. If spring or other sub-surface water is encountered, the contractor will be paid an additional price per day for keeping the excavation free at the price quoted in his bid or agreed upon between the contractor and the owner.

CONCRETE FOOTINGS AND FOUNDATIONS

Footings and foundation walls shall be installed to dimensions indicated on the plans. The mixture shall be one (1) part Portland Cement, three (3) parts clean sharp sand, five (5) parts broken stone, trap-rock, gravel or other suitable clean coarse aggregate, graded in size to pass through a 2" screen, adequately mixed with a sufficient amount of clean water in a mechanical batch mixer, placed in the forms within one-half hour thereafter. Substantial and tight forms shall be built on both inner and outer surface foundations of the walls. No part of the excavation wall shall be used as a form.

FINISHED CEMENT WORK

The under-course of the basement floor shall be poured over a well-tamped 3" cinder bed and shall

be composed of concrete as specified above, laid so that there is a gradual fall from the foundation to the basement sewer drain. This concrete is to be 3" thick, plus a finish coat of one (1) part Portland Cement and three (3) parts clean sharp sand to be applied to a thickness of not less than one-half inch on top of all concrete under-courses, finished smooth under a steel trowel. Concrete fill shall be provided for tile floors in the bathrooms.

BRICKWORK AND MASONRY ITEMS

Exterior walls are to be 13" variegated matt brick laid in Flemish bond backed with dobies and salmon brick. Rear walls of building are to be faced with common brick and the fire walls are to be made of salmon brick and dobies. The contractor shall provide all brickwork as specified on the plans, comprising a chimney as indicated. Flues are to be lined with terra cotta of the proper dimension. Average-grade cut stone sills are to be provided for windows on the front and side of the building and stone lintels are to be provided over the basement windows. Ornamental work and roof coping to be of terra cotta.

LATHING AND PLASTERING

Contractor shall provide for 3-coat plastering over rock lath (or expanded metal lath) secured to studs (or joints) at each intersection with blued lath nail, corner beads provided for all exterior angles. The scratch coat shall be one (1) part lime putty to two (2) parts sand, with proper proportions of fiber and sand added. The brown coat shall be one (1) part lime putty to three (3) parts sand. The finished coat shall be one (1) part dry gauged plaster to two (2) parts dry hydrated lime. First grade workmanship is required in the application of each plaster coat. No cornice or other ornamental plaster work is contemplated under this contract.

The basement ceiling shall be covered with two coats of plaster, including sand float finish coat.

TILING

This specification provides for tiling all bathrooms. Floors shall be prepared by the carpenter and mason, and walls by plaster contractor as specified above. The tile setter shall furnish and install 4-1/4 x 4-1/4 glazed commercial-grade wall tile with approved caps, cove bases, angles, finials, etc. Tile shall be installed to a height of 3' 6" and to ceiling around bath tubs. Bathroom floors shall be 1" or 2" hexagonal white ceramic tile.

The contractor shall furnish all setting materials and on completion leave the entire work properly grouted and cleaned.

ROUGH CARPENTRY AND FRAMING MATERIAL

for milling.

Rough carpentry and framing material shall be the best grade provided in local practice. It may be yellow pine, white pine, fir or hemlock. All material shall be of sizes indicated, with allowance

Floor Joists	2" x 12" - spaced 16" c to c
Ceiling Joists	2" x 8" - spaced 16" c to c
Roof Rafters	2" x 6" - spaced 16" c to c
Studding in interior partitions	2" x 4" - spaced 16" c to c

One line of cross bridging shall be provided for each floor span exceeding 10'. The entire structure shall be braced and trussed where necessary and securely nailed as required by best practice.

UNDERFLOORING AND ROOF SHEATHING

6d nails.

Sheathing on roof and all sub-flooring shall be provided as indicated. Material shall be No. 2, dressed and not over 6" wide, laid diagonally for floors and each intersection well secured by two

ROOFING

one thickness of Celotex.

The mansard portion of the roof shall be a good grade of variegated slate. The flat portion of the roof is to be Certaineed built-up asphalt laid over

FLASHING - SHEET METAL WORK

ly supported by approved hangers and straps.

Provide and install 16-ounce copper flashing for valleys and angles, chimney counter and step flashed. Provide gutters and downspouts of 16 ounces copper with necessary fittings, all securely

MILLWORK - WINDOW FRAMES AND SASH

shall be 1-3/8" thick, check-rail type. Exterior door frames shall be 2" clear pine rabbeted to receive 1-3/4" stock doors.

Stock window frames and sash shall be provided of the sizes shown on the plans. These shall be double-hung type as indicated and sash shall be glazed with single-strength clear glass. The sash

MILLWORK - INTERIOR

of yellow pine of the best quality and of approved design as carried in local stock. Exterior doors shall be clear pine 1-3/4" thick of the size shown on the plans as selected from local catalog stock. Interior doors shall be of clear pine, six panel colonial design 1-3/8" thick of the size indicated on the plans selected from local catalog stock.

All stock trim necessary to complete the various parts of the work indicated shall be provided. All casings, base, trim, stools and mouldings shall be

FINISHED FLOORS

baths. Flooring shall be laid tight and even and nailed every 16". All oak flooring shall be scraped or sanded and completed ready for the painters. Before placing finished flooring all sub-flooring shall be covered with one course of building paper.

Finished floors shall be of clear plain red oak 2-1/4" x 13/16", to be placed over all floor areas on the first, second and third floors, except the

BUILT-IN CABINETS

Built-in kitchen cabinets shall be provided as indicated on the detail plans.

ENTRANCE HALLS AND STAIRS

tered. The floors and stair landings are to be of terrazzo.

Each entrance hall shall be equipped with a 6-receptacle "Keilson" government-approved apartment house mail box; finish to be "sprayed brass."

All interior stairs are to be metal with terrazzo treads and risers. The interior walls of the entrance halls are to have claytile wainscoting. The remainder of the walls and ceilings are to be plastered.

REAR PORCHES AND STAIRS

Rear porches and stairs are to be made of structural steel with concrete floors. The size is in-

licated on the plans. There are to be three outside entrances to the basement of the building, and these entrances are to be furnished with concrete steps.

PAINTING

Immediately upon completion of all exterior and interior woodwork the painter shall apply a priming coat consisting of white lead, pure linseed oil and turpentine in the proportions considered best in local practice. Upon completion of the priming coat, all nail holes and other imperfections in the work shall be stopped and filled with white lead putty. Before priming, knots and shakes shall be stopped with one coat of pure orange shellac. Second and third coats shall be mixed and applied in the color selected. Painters may mix at the job all white lead and oil paint in the proportions customary in the locality, using paste, white lead, pure linseed oil, turpentine and dryer, mixed in such proportions as to weigh not less than 15 lbs. per gallon. Painter may use the best qualities of approved ready-mixed paints. Each can must bear the formula of its contents. Materials shall be used direct from this original package and in accordance with the manufacturer's directions. (This contract does not contemplate the painting or decoration of plastered walls and ceilings.) Painter shall oil-stain oak floors in shade selected and fill with an approved paste filler. Floors shall then be finished with three coats of white shellac.

PLUMBING

This specification contemplates a complete plumbing, drainage and water-supply system for 18 bathrooms, 18 kitchens and 9 laundry trays in basement.

Sewer Line, Vents and Drainage. House sewer line of 6" shall be carried to a point 50 feet beyond foundation walls. Vent and drainage system shall be installed and tested in accordance with best local practice, municipal code, or requirements of American Society of Sanitary Engineers. All joints shall be filled with oakum and poured lead and well calked. 2" vent and waste lines shall be of genuine galvanized wrought iron. 6" vitrified tile pipe shall be continued beyond the foundation walls for 50 feet and the joints securely set with cement mortar. Plumber shall excavate and backfill all pipe trenches.

Water Supply. A pipe shall be continued 50 feet beyond the foundation walls in separate trench. This shall be laid using 1" copper water tubing with sweat-joint fittings. One-half inch copper tubing with sweat-joint pipe and fitting shall be installed for hot and cold water supply and connected with all plumbing fixtures and boiler. (Water closets and boiler shall be provided with cold-water supply only.) All pipe and fitting shall be installed in accordance with manufacturer's instructions.

Fixtures. There shall be furnished and installed to the rough connections here provided fixtures of quality equal to those specified in the following list: (The following list covers items manufactured by the Independent Plumbing and Heating Company. Contractor is permitted to substitute any equal combination.)

18 - 60" Queen Sinks #457

18 - Knight Pedestal Lavatories 20" x 24" over all #224

18 - Colonial Vitreous China Toilets with white ivoryette seat #344

18 - 60" bath tubs #123

Hot Water Supply. An indirect water heater (Sims, Allberger, Fre-Flo or equal) is to be provided under these specifications. Heater must be capable of providing ample supply of hot water (100 degree Fahrenheit temperature rise) with

normal boiler operation.

Alternates. If local building codes and practice do not permit the use of copper tubing and sweat-joint fittings for water supply, the contractor shall furnish genuine wrought-iron galvanized pipe in place thereof. However, where substitution is made, pipe one size larger than specified shall be provided.

HEATING PLANT

The purpose of this specification is to describe complete installation of the 1-pipe vacuum heating plant. All pipes shall be genuine wrought iron, installed in sizes, pitch and direction as indicated on the heating plans and instructions provided by the manufacturer furnishing the vacuum system accessories.

Radiation furnished by this contract consists of a total of 2200 square feet concealed steam radiation. The boiler shall be of capacity and design equal to Kewanee Boiler No. 4K, complete including insulating jackets, standard fittings and tools.

The contractor shall guarantee the heating plant to heat the entire first, second and third floors of the building to 70 degrees Fahrenheit when the outside temperature is at Zero Fahrenheit and wind velocity is not in excess of 30 miles per hour. This should be accomplished with not more than a 2-pound gauge pressure at the boiler, or with the vacuum at the height specified by the manufacturer of the vacuum system accessories. The plant shall be tested as required and left complete.

Covering - Pipe and Boiler Jacket. The boiler shall have standard insulated jacket as regularly furnished by manufacturer, lined with not less than 1" thickness of asbestos sheet insulation, and 4" asbestos fill shall be placed on floor within jacket. All exposed supply pipes in the cellar and within building walls shall be covered with approved 2" air-cel asbestos covering. All exposed covering shall be banded at the joints with brass strapping.

Painting. All exposed pipes in the basement as well as any exposed unfinished cast-iron parts of the boiler shall receive two coats of approved smoke-stack black. All radiators, and any exposed pipes above the first floor level shall be thoroughly cleaned and receive two coats of approved heat-resisting radiator paint in color selected.

ELECTRIC WIRING

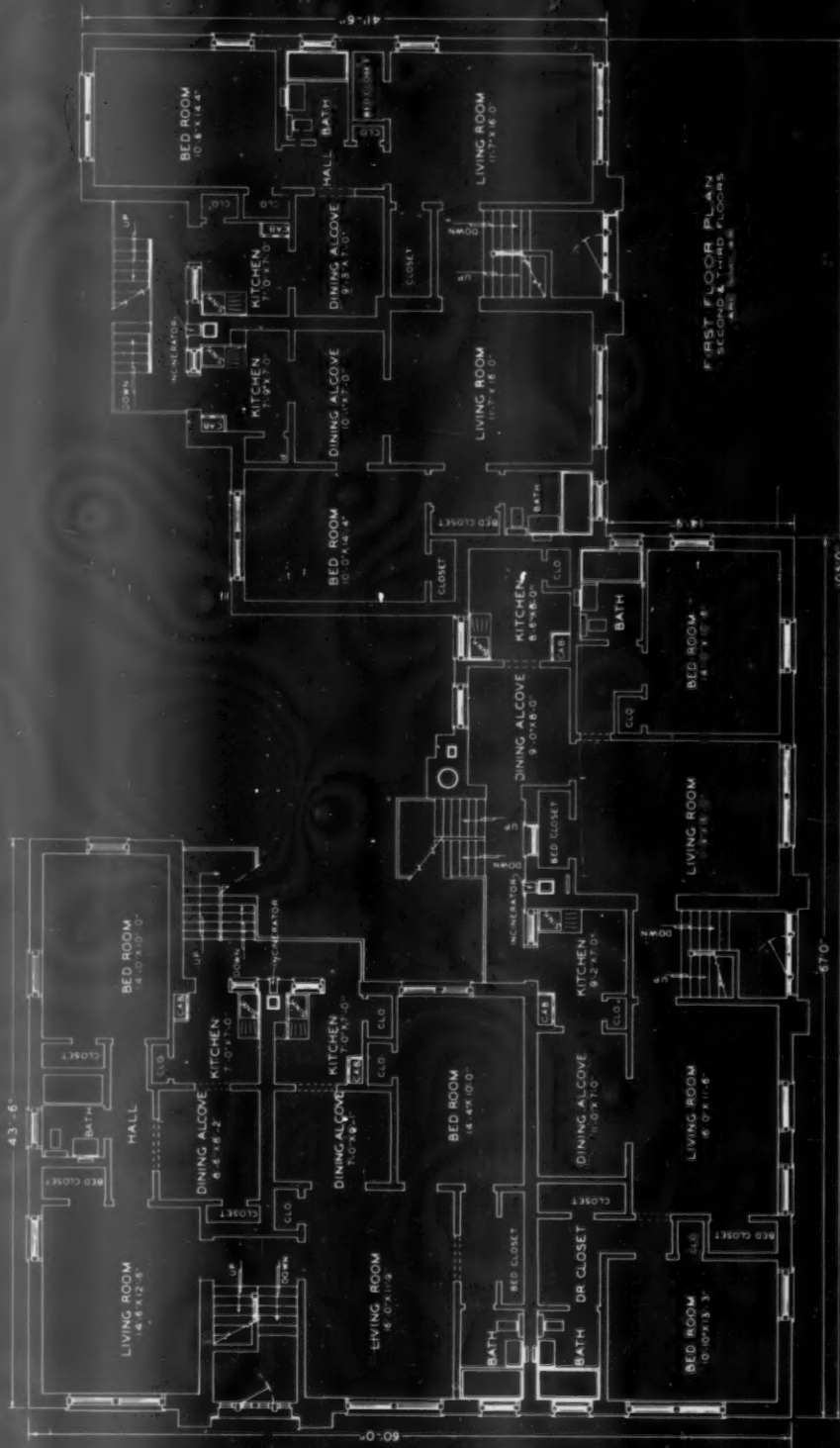
It is the purpose of this specification to describe a complete electrical installation. All material shall be of standard make and of quality and installed as required by the National Board of Fire Underwriters. All outlets shall terminate in approved metal boxes. Switches shall be of toggle type. All outlets other than for lighting fixtures and switches shall be equipped with standard duplex connections. Wiring to outlets shall be of approved-size BX cable of sufficient size to carry the circuit load.

Each circuit shall be switched and fused and extended to a central panel board. This contractor shall terminate all circuits at an appropriate meter and fuse board.

Connection from meter panel to public service lines is not included in this contract, nor are electrical fixtures and appliances provided.

MECHANICAL EQUIPMENT

Each apartment is to be equipped with one 4-burner side oven gas stove with automatic oven regulator; one 6-cubic-foot electric refrigerator; and one In-a-Door or Roll-Away bed. The building is to be provided with 3 Kerner incinerators, each incinerator to have a refuse door installed in the wall of the building at the proper height above the first, second and third floor service stair landings.



TYPICAL FLOOR PLAN
EIGHTEEN - FAMILY APARTMENT

BUILDING COSTS OF AN EIGHTEEN-FAMILY BRICK APARTMENT HOUSE BUILT IN SAINT LOUIS

MATERIAL

1. Cost of face brick, salmon brick, dolies, flue lining, terra cotta, cut stone and building stone.
2. Cost of all materials going into mortar, concrete, cement and plaster.
3. Cost of all lumber, flooring, millwork, roofing and paint.
4. Cost of all materials for plumbing, heating, electrical work, sheet metal work, iron work, hardware, marble, tiling, vitrolite and special equipment.

5. TOTAL MATERIAL COST.

Year	1	2	3	4	5
1913	\$ 3564	\$1856	\$ 7440	\$ 7736	\$20936
1914	3944	1864	7464	7303	20575
1915	3910	1869	7452	7578	20609
1916	4319	1844	7935	9725	23823
1917	4908	2246	8953	12588	28695

1918	9707	2768	12200	13143	33238
1919	9748	3346	13965	12826	36685
1920	7766	4057	17395	14770	44068
1921	6540	3905	12257	11862	34264
1922	6795	3163	12562	11190	33709
1923	7217	3362	13455	12176	36210
1924	7340	3502	12090	14505	37437
1925	7118	3191	11875	18333	40517
1926	6360	3024	11038	18460	39082
1927	6249	3061	10046	19998	39348

1928	6119	2820	10271	17010	36220
1929	5784	2759	10615	14397	33555
1930	5889	2359	9194	13577	33178
1931	3334	2340	8947	13797	29478
1932	4763	2423	7445	12412	27042
1933	5530	2448	8830	10350	27348
1934	6080	2680	11600	12325	32685
1935	6080	2635	10775	12960	33470
1936	5525	2550	10400	13580	32455
1937	6210	2610	10660	13410	35080

1938	6200	2615	10480	13640	32945
1939	5410	2560	10400	13050	31420
Ja 1940	5689	2560	10700	13720	31669
Ap 1940	5550	2560	11040	12890	32040
Ja 1940	5550	2560	11040	12890	32040
O 1940	5550	2610	13150	12890	34300
Ja 1941	5810	2635	13150	13130	34728
Ap 1941	5790	2635	12890	13130	34145
Ja 1941	5910	2720	13880	13130	35640
O 1941	5940	2750	14160	14010	36860

LABOR

6. Cost of setting all stone, tile, marble and vitrolite, laying brick and pouring concrete.
7. Cost of labor on lathing and plastering.

8. Cost of carpentry, roofing, flooring, painting, decorating, and builder's general supervision.

9. Cost of installing plumbing material and fixtures, wiring, setting plant and sheet metal work.

10. Cost of excavation and grading.

11. TOTAL LABOR COST.

Year	6	7	8	9	10	11
1913	\$ 3620	\$2640	\$ 4001	\$1476	\$1063	\$13399
1914	3920	2650	4651	1476	1082	13459
1915	3580	2650	4681	1542	1082	12495
1916	3740	2850	4692	1602	1060	13744
1917	4147	2710	5063	1657	1110	14687

1918	4343	2600	5437	1717	1110	15307
1919	4736	3000	5843	1764	1332	16695
1920	4626	3150	8255	2035	1522	19588
1921	4850	3330	8430	2062	1522	20214
1922	4940	3400	7817	2225	1598	19990
1923	5194	3400	8605	2404	1801	21404
1924	6450	4150	10075	2831	1891	25392
1925	6960	4150	10221	2631	1691	25853
1926	6854	3700	10311	2538	1891	25094
1927	6614	3950	10244	2505	1891	24904

1928	6394	3390	10244	2560	1891	24470
1929	5970	3020	10284	2551	1946	23771
1930	5673	2359	8610	2544	1773	21159
1931	5120	1950	7428	2534	1332	18364
1932	4238	1625	6467	2100	1175	15625
1933	3990	1860	5080	2040	1100	13770
1934	3990	1860	5080	2040	1100	13770
1935	3150	1860	4320	2040	1245	16725
1936	5510	2245	7490	2040	1580	16775
1937	5620	2380	8400	1675	1580	16935

1938	5126	2025	7305	1675	1245	15855
1939	5040	1910	6590	1675	1245	14460
Ja 1940	6210	2950	7840	1875	1560	20255
Ap 1940	6210	2950	7840	1875	1560	20255
Ja 1940	6310	2950	7145	1860	1560	19845
O 1940	5950	2950	7305	1890	1560	19675
Ja 1941	6770	3310	8320	1890	2045	22235
Ap 1941	6650	3115	8515	1890	2130	22300
Ja 1941	6910	3190	9490	1890	2130	23610
O 1941	7720	3340	10180	2180	2130	25450

OVERHEAD

12. TOTAL OVERHEAD COST. This item includes cost of all city permits, city inspections and utility connection costs; cost of financing, interest during construction, insurance and sales commission on the building only; and estimated profit made by the builder.

13. TOTAL COST OF CONSTRUCTION.

Year	12	13	Cu. R.	Sq. R.
1913	\$ 6543	\$ 40378	24.1	\$ 3.08
1914	6493	40327	24.1	3.06
1915	6559	40953	24.3	3.06
1916	7141	44708	26.6	3.37
1917	8214	51596	30.6	3.89

1918	9141	58286	34.6	4.40
1919	9917	63297	37.6	4.77
1920	11795	75391	44.8	5.69
1921	10338	64816	38.5	4.89
1922	10109	63608	37.9	4.81
1923	10874	68488	40.7	5.17
1924	11966	74795	44.4	5.64
1925	12721	78091	47.0	5.96
1926	12320	76496	45.4	5.77
1927	12226	76478	45.4	5.77

1928	11629	72328	43.0	5.45
1929	11387	70713	42.0	5.33
1930	10488	64646	38.4	4.88
1931	9580	57202	34.0	4.31
1932	8283	51050	30.3	3.85
1933	7993	49101	29.2	3.70
1934	8742	55197	32.8	4.16
1935	9193	58388	34.7	4.40
1936	9609	60539	36.1	4.59
1937	10047	62992	37.4	4.75

1938	9093	61863	36.7	4.67
1939	9243	57123	33.9	4.30
Ja 1940	9939	61863	36.7	4.67
Ap 1940	10092	62297	37.0	4.70
Ja 1940	9933	61818	36.7	4.66
O 1940	10267	64142	38.1	4.84
Ja 1941	11463	68423	40.8	5.16
Ap 1941	10700	67145	39.8	5.06
Ja 1941	11171	70421	41.6	5.31
O 1941	11666	73996	43.9	5.58

THIRTY - FAMILY APARTMENT



Content: 303, 534 cubic feet
21, 372 square feet

DESCRIPTIVE SPECIFICATIONS

GENERAL CONDITIONS - Same as 18-family brick apartment house.

PREPARATION OF SITE AND EXCAVATION - Same as 18-family brick apartment house.

CONCRETE FOOTINGS, FOUNDATIONS, COLUMNS, BEAMS AND FLOORS

Footings and foundation walls shall be installed to dimensions indicated on the plans. The mixture shall be one (1) part Portland Cement, three (3) parts clean sharp sand, five (5) parts broken stone, trap-rock, gravel or other suitable clean coarse aggregate, graded in size to pass through a 2" screen, adequately mixed with a sufficient amount of clean water in a mechanical batch mixer, placed in the forms within one-half hour thereafter. Substantial and tight forms shall be built on both inner and outer surface foundations of the walls. No part of the excavation wall shall be used as a form.

The columns, beams and floors shall be of reinforced concrete, 1:2:4 mix; columns and beams are to be provided and reinforced as indicated by the structural detail plans.

FINISHED CEMENT WORK - Same as 18-family brick apartment house.

BRICKWORK AND MASONRY ITEMS

The exterior (curtain) walls are to be of 13" matt brick, laid in Flemish bond, and backed with dobies. The rear walls of the building are to be faced with common brick. The contractor shall provide all brickwork as specified on the plans, comprising a chimney as indicated. Flues are to be lined with terra cotta of the proper dimension. Average-grade stone sills are to be provided for windows on the front and sides of the building. Ornamental work and roof coping to be of terra cotta.

Interior partitions are to be of 4" gypsum block.

LATHING AND PLASTERING Contractor shall provide for 3-coat plastering over the 4" gypsum block. The finished coat shall be one (1) part dry gauged plaster to two (2) parts dry hydrated lime. First grade workmanship is required in the application of each plaster coat. No cornice or other ornamental plaster work is contemplated under this contract.

TILING - Same as 18-family brick apartment house.

ROUGH CARPENTRY AND FRAMING MATERIAL Rough carpentry and framing material (comprising only the roof rafters in the roof towers) shall be the best grade provided by local practice. It may be yellow pine, white pine, fir or hemlock. These roof rafters are to be 2 x 6's spaced 16" c to c.

These rafters are to be covered by No. 2 sheathing not over 6" wide, and well secured at each intersection by two 6d nails.

ROOFING The flat portion of the roof is to be built-up asphalt over a 1" layer of Celotex laid over a 3" reinforced roof slab.

FLASHING - SHEET METAL WORK - Same as 18-family brick apartment house.

MILLWORK - WINDOW FRAMES AND SASH - Same as 18-family brick apartment house.

MILLWORK - INTERIOR - Same as 18-family brick apartment house.

FINISHED FLOORS Finished floors shall be of clear plain red oak 2-1/4" x 13/16", laid on wood screeds set in concrete. Flooring shall be laid tight and even and nailed every 16". All oak flooring shall be scraped or sanded and completed ready for the painters.

BUILT-IN CABINETS Built-in kitchen cabinets shall be provided as indicated on the detailed plans.

ENTRANCE HALLS AND STAIRS - Same as 18-family brick apartment house.

REAR PORCHES AND STAIRS Rear porches and stairs are to be made of structural steel with concrete floors, sizes as indicated on the plans. There are to be 5 entrances to the basement of the building and these entrances are to be furnished with concrete steps.

PAINTING - Same as 18-family brick apartment house.

PLUMBING This specification contemplates a complete plumbing, drainage and water-supply system for 30 bathrooms, 30 kitchens, and for 15 laundry trays in

the basement.

Sewer Line, Vents and Drainage. Same as 18-family brick apartment house.

Water Supply. Same as 18-family brick apartment house.

Fixtures. There shall be furnished and installed to the rough connections here provided fixtures of equal quality to those specified in the following list: (The following list covers items manufactured by the Independent Plumbing and Heating Company. Contractor is permitted to substitute any equal combination.)

30 - 60" Queen Sinks #457

30 - Knight Pedestal Lavatories 20" x 24" over all #224

30 - Colonial Vitreous China Toilets with white ivoryette seat #344

30 - 60" Bath Tubs #123

Hot Water Supply. Same as 18-family brick apartment house.

Alternates. Same as 18-family brick apartment house.

HEATING PLANT

The purpose of this specification is to describe complete installation of the 2-pipe steam heating plant. All pipes shall be of genuine wrought iron installed in sizes, pitch and direction as indicated on the heating plans and instructions provided by the manufacturer furnishing the vacuum system accessories.

Radiation furnished by this contract is to consist of a total of 4000 square feet concealed steam radiation. The boiler shall be of capacity and design equal to Kewanee boiler #10K, and is to be complete including insulating jackets, standard fittings and tools.

The contractor shall guarantee the heating plant to heat the entire first, second and third floors of the building to 70 degrees Fahrenheit when the outside temperature is at Zero Fahrenheit and wind velocity is not in excess of 30 miles per hour. This should be accomplished by not more than 2-lb. gauge pressure at the boiler. The plant shall be tested as required and left complete.

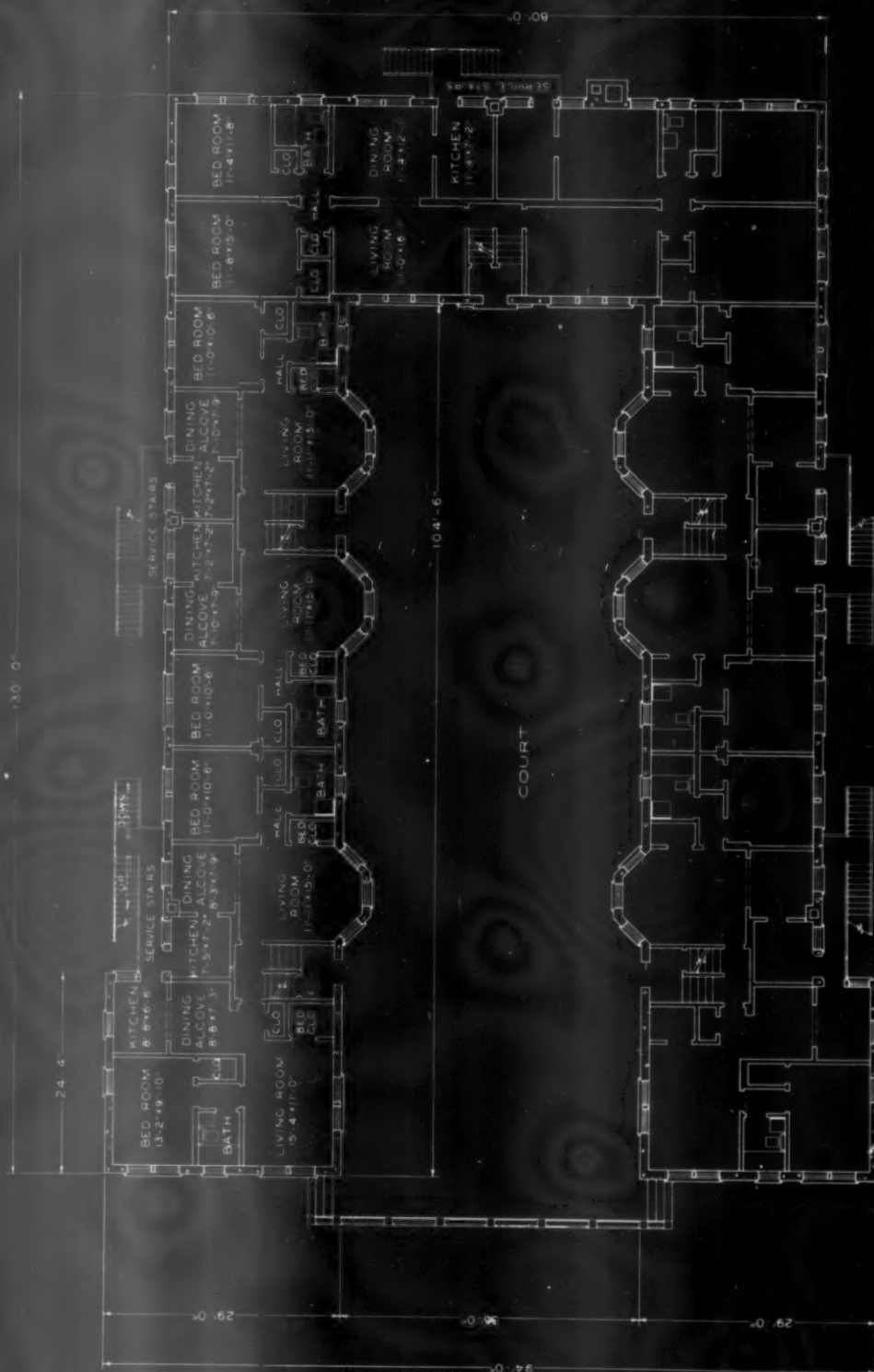
Covering - Pipe and Boiler Jacket. Same as 18-family brick apartment house.

Painting. Same as 18-family brick apartment house.

ELECTRIC WIRING - Same as 18-family brick apartment house.

MECHANICAL EQUIPMENT

Each apartment is to be equipped with one 4-burner side oven gas stove with automatic oven regulator; one 6-cubic-foot electric refrigerator; and one In-a-Door or Roll-Away bed. The building is to be provided with 5 Kerner incinerators, each incinerator to have a refuse door installed in the wall of the building at the proper height above the first, second and third floor service stair landings.



TYPICAL FLOOR PLAN
THIRTY FAMILY APARTMENT

BUILDING COSTS OF A THIRTY-FAMILY REINFORCED CONCRETE APARTMENT HOUSE BUILT IN SAINT LOUIS

MATERIAL

1. Cost of face brick, dobbies, fire lining, terra cotta, cut stone, marble and tile.
2. Cost of concrete, claytile and reinforcing.
3. Cost of all plastering materials.
4. Cost of all lumber, flooring, millwork, roofing, paint, etc.
5. Cost of all materials for plumbing, heating, electrical work, sheet metal work, iron work, hardware and special equipment.
6. TOTAL MATERIAL COST.

	1	2	3	4	5	6
1913	\$10,394	\$ 5,977	\$ 3,642	\$12,537	\$14,015	\$47,555
1914	10,694	5,437	3,642	12,659	13,965	40,247
1915	10,994	5,467	3,642	12,640	14,260	47,023
1916	12,164	7,399	3,587	13,336	18,296	54,792
1917	13,534	10,693	4,025	14,100	23,467	66,219
1918	15,724	10,157	5,366	19,330	25,974	70,581
1919	19,374	11,365	6,014	22,046	25,679	84,990
1920	24,210	15,110	7,936	27,550	30,408	105,424
1921	20,193	11,220	6,890	19,912	24,134	82,349
1922	20,281	10,010	6,559	20,818	23,655	81,123
1923	22,230	11,005	6,385	21,905	25,910	85,435
1924	23,130	10,955	6,730	19,885	24,583	85,283
1925	22,210	10,785	6,678	19,305	30,698	89,676
1926	21,046	10,240	6,029	18,192	30,475	86,882
1927	20,231	10,020	6,076	16,494	26,996	81,819
1928	19,754	10,020	5,893	16,227	26,035	79,929
1929	19,120	10,160	5,631	17,067	28,385	80,363
1930	18,630	9,973	5,952	14,737	26,495	74,761
1931	16,426	7,829	5,719	12,847	24,066	66,887
1932	14,416	8,015	5,796	11,813	21,354	61,394
1933	18,150	8,860	5,570	15,560	20,030	85,900
1934	19,950	9,060	5,660	16,860	21,100	76,360
1935	19,950	8,930	5,466	15,600	22,150	76,316
1936	9,480	9,180	5,700	17,600	23,250	75,210
1937	20,400	9,500	5,845	20,200	23,600	79,635
1938	18,620	9,200	5,670	17,770	22,420	73,970
1939	18,600	9,180	5,766	17,680	23,720	74,950
1940	18,570	9,220	5,810	18,850	21,750	74,200
1941	18,110	9,220	5,810	18,850	21,960	73,750
1942	18,110	9,160	5,810	18,860	21,960	73,920
1943	18,110	9,150	6,030	22,410	21,960	77,680
1944	19,050	9,370	6,030	22,800	22,500	79,650
1945	18,950	9,300	5,940	21,800	22,450	78,440
1946	19,400	9,320	6,530	24,250	22,450	81,950
1947	19,490	9,330	6,650	24,100	24,000	83,570

LABOR

7. Cost of setting all stone, tile and marble and laying all brick.
8. Cost of carpentry, roofing, flooring, painting, decorating, and builder's general supervision.
9. Cost of labor on plastering.
10. Cost of installing plumbing material and fixtures, wiring, heating plant and sheet metal work.
11. Cost of excavation and miscellaneous.
12. TOTAL LABOR COST.

	7	8	9	10	11	12
1913	\$ 7,967	\$ 7,217	\$ 4,630	\$ 5,367	\$1,900	\$27,101
1914	7,967	7,277	4,630	5,367	1,900	27,161
1915	7,957	7,277	4,565	5,597	1,900	27,336
1916	8,307	7,326	4,690	5,777	1,900	28,000
1917	9,417	7,953	4,860	5,954	1,900	30,104
1918	9,574	8,600	5,020	6,084	1,900	31,178
1919	10,698	9,230	5,330	6,326	2,120	33,704
1920	10,351	13,261	5,090	7,414	2,710	36,826
1921	11,101	13,483	5,450	7,527	2,710	40,271
1922	11,024	12,528	5,560	8,044	2,710	39,866
1923	11,933	13,698	5,560	8,560	3,100	42,849
1924	14,538	16,213	6,840	10,087	3,380	51,058
1925	15,832	16,360	6,910	9,497	3,380	51,979
1926	15,162	16,440	6,100	9,205	3,380	50,287
1927	14,995	16,360	6,000	9,002	3,380	49,260
1928	14,474	16,360	5,720	8,308	3,240	47,917
1929	13,568	16,462	4,740	8,508	3,177	47,917
1930	13,466	15,536	4,537	9,286	3,100	43,966
1931	11,800	11,641	3,980	9,285	2,370	38,056
1932	9,819	10,090	3,270	7,628	2,080	33,085
1933	9,160	8,010	3,000	7,460	1,970	29,620
1934	9,160	8,010	3,000	7,460	1,970	29,620
1935	11,880	9,980	3,805	7,460	2,250	35,375
1936	12,700	11,650	4,300	7,460	2,815	36,925
1937	13,300	12,880	4,145	6,685	2,815	36,825
1938	11,750	11,100	3,820	6,100	2,250	35,020
1939	13,620	11,825	5,190	6,100	2,720	36,455
1940	13,540	11,200	5,340	6,100	2,815	36,985
1941	13,540	11,200	5,340	6,100	2,815	36,985
1942	13,540	11,200	5,690	6,600	2,215	41,095
1943	13,760	11,520	5,630	6,910	2,815	40,595
1944	14,800	13,120	6,120	6,910	3,660	44,700
1945	15,320	13,410	5,970	6,910	3,800	45,410
1946	15,950	14,900	6,080	6,910	3,800	47,670
1947	17,800	16,200	6,180	8,000	3,800	52,070

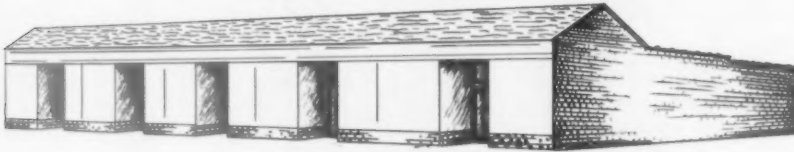
OVERHEAD

13. TOTAL OVERHEAD COST. This item includes cost of all city permits, utility connection costs, plans and engineering fees; cost of interest during construction and taxes and insurance; and estimated profit made by the builder - 7%.
14. TOTAL COST OF CONSTRUCTION.

	13	14	Cu. ft.	Sq. ft.
1913	\$ 9,980	\$ 84,564	27.96	\$ 3.96
1914	9,798	83,206	27.4	3.89
1915	9,983	84,332	27.8	3.95
1916	10,918	93,710	30.9	4.38
1917	12,543	108,866	35.9	5.09
1918	13,763	121,522	40.0	5.69
1919	15,033	133,435	44.0	6.24
1920	17,953	162,203	53.4	7.59
1921	15,958	138,576	45.7	6.48
1922	15,838	136,827	45.1	6.40
1923	10,683	144,967	47.8	6.75
1924	17,918	154,239	50.6	7.25
1925	16,628	160,693	52.9	7.52
1926	18,323	154,592	50.9	7.23
1927	17,607	149,243	49.2	6.98
1928	16,979	146,545	48.3	6.86
1929	16,979	145,269	47.9	6.80
1930	10,108	134,895	44.4	6.31
1931	14,578	120,521	39.7	5.64
1932	13,075	107,554	35.4	5.03
1933	14,932	110,452	36.4	5.17
1934	15,922	122,132	40.3	5.71
1935	17,524	128,215	42.6	6.05
1936	18,531	132,668	43.7	6.21
1937	20,900	140,360	46.2	6.57
1938	19,775	128,665	42.4	6.02
1939	20,680	135,085	44.5	6.32
1940	20,829	134,024	44.2	6.25
1941	20,767	133,512	44.0	6.25
1942	21,221	136,296	44.9	6.37
1943	21,641	139,916	46.1	6.55
1944	22,744	147,094	48.5	6.88
1945	22,737	146,387	48.3	6.86
1946	23,667	153,287	50.3	7.17
1947	24,768	160,426	52.9	7.51

Ja	1942	19,400	9,330	6,704	24,850	25,300	86,174	16,110	16,500	6,310	5,000	3,940	52,860	25,312	164,346	54.1	7.69
Ap	1942	21,046	9,560	6,704	25,500	28,500	91,310	16,110	16,500	6,310	5,000	3,940	52,860	26,002	170,172	56.1	7.96
Ja	1943	21,046	9,560	6,704	25,500	28,500	91,010	16,180	16,680	6,210	8,340	3,940	52,860	26,127	170,797	56.3	7.91
O	1943	21,046	9,560	6,704	25,510	28,500	91,620	16,320	14,900	6,210	6,910	3,800	48,140	25,066	164,826	54.3	7.71
Ja	1943	21,046	9,560	6,540	25,900	28,500	91,546	16,320	14,900	6,210	6,910	3,800	48,140	25,053	164,739	54.3	7.71
Ap	1943	21,046	9,560	6,540	25,900	28,500	91,546	16,320	14,900	6,210	6,910	3,800	48,140	25,053	164,739	54.3	7.71
Ja	1943	21,048	9,560	6,540	25,900	28,500	91,546	15,500	13,900	6,000	6,910	3,800	48,110	24,645	162,301	53.5	7.59
O	1943	21,048	9,560	6,910	29,000	28,500	95,016	15,500	13,900	6,000	6,910	3,800	48,110	25,114	166,240	54.8	7.78
Ja	1944	21,048	9,560	6,910	31,250	28,500	97,266	15,500	13,900	6,000	6,910	3,800	48,110	25,419	168,795	55.6	7.90
Ap	1944	21,048	9,560	6,910	32,450	28,500	98,466	15,500	13,900	6,000	6,910	3,800	48,110	25,580	170,156	56.1	7.96
Ja	1944	21,048	9,560	7,000	32,450	28,500	98,356	15,500	13,900	6,000	6,910	3,800	48,100	25,593	170,259	56.1	7.97
O	1944	21,060	9,920	7,000	32,450	28,500	99,670	16,650	13,900	6,000	6,910	3,340	49,060	26,367	175,237	57.7	8.20
Ja	1945	22,400	9,920	7,000	33,100	28,500	100,820	17,280	15,200	6,000	6,910	5,340	50,670	26,850	178,440	58.8	8.35
Ap	1945	22,400	9,920	7,000	33,100	28,500	101,150	17,280	15,200	6,000	6,910	5,340	50,670	26,850	178,440	58.8	8.35
Ja	1945	22,400	9,920	7,000	33,110	28,500	99,846	17,315	16,637	7,308	8,054	5,347	54,661	27,435	182,382	60.1	8.53
O	1945	22,466	10,373	8,238	33,437	28,400	102,673	23,243	21,292	8,632	10,936	6,196	71,299	27,615	205,587	67.7	9.62
Ja	1946	23,487	10,465	7,047	33,437	29,073	103,509	23,243	22,262	8,698	10,936	6,196	71,665	31,833	207,007	68.2	9.69
Ap	1946	24,962	10,919	7,047	33,437	30,475	106,980	25,217	22,262	8,198	10,936	6,196	73,944	32,765	213,709	70.4	10.00
Ja	1946	26,623	11,348	7,054	34,220	32,303	111,239	25,217	23,729	8,198	10,936	6,196	75,987	33,650	220,376	72.6	10.31
O	1946	26,623	11,348	7,769	35,964	34,650	116,392	25,427	23,729	8,198	11,506	6,196	76,337	34,482	227,221	74.9	10.63
Ja	1947	24,013	12,278	9,399	52,300	36,400	135,777	28,505	25,482	11,084	13,964	6,591	85,626	38,704	257,954	85.0	12.07
Ap	1947	24,013	12,278	9,399	52,300	36,400	135,777	28,505	25,482	11,084	13,964	6,591	85,626	38,704	257,954	85.0	12.07
Ja	1947	25,510	12,700	9,405	46,100	38,200	129,915	28,505	25,482	11,084	13,964	6,591	85,626	38,282	253,823	83.6	11.88
O	1947	27,250	13,025	9,420	48,500	38,000	136,195	28,505	25,482	11,084	13,964	6,591	85,626	39,078	260,899	86.0	12.21
Ja	1948	27,450	13,400	10,400	50,450	39,600	141,300	31,800	26,600	11,470	14,190	8,160	92,240	41,186	274,726	90.4	12.85
Ap	1948	27,450	13,400	10,400	50,450	39,600	141,300	31,800	26,600	11,470	14,190	8,160	92,240	41,186	274,726	90.4	12.85
Ja	1948	28,400	13,950	10,600	50,800	40,800	145,850	33,400	28,300	12,200	15,850	8,320	97,770	42,602	286,742	94.5	13.42
O	1948	30,500	14,400	11,250	51,000	52,700	159,850	33,400	28,300	12,200	15,850	8,320	97,770	44,154	297,274	97.9	13.91
Ja	1949	31,200	14,700	11,250	50,100	51,600	158,950	33,400	28,350	12,200	15,850	8,320	97,770	44,875	302,495	99.7	14.15
Ap	1949	31,200	14,700	11,250	50,100	51,600	158,950	33,400	28,350	12,200	15,850	8,320	97,770	44,875	302,495	99.7	14.15
Ja	1949	31,200	14,700	11,250	47,510	48,000	152,460	34,200	28,700	12,150	15,850	8,320	99,220	44,257	296,327	98.3	13.96
Ap	1949	31,200	14,700	11,250	47,510	48,000	152,460	34,200	28,700	12,150	15,850	8,320	99,220	44,257	296,327	98.3	13.96
Ja	1950	31,200	14,700	11,250	47,510	48,000	152,460	34,200	28,700	12,150	15,850	8,320	99,220	44,257	296,327	98.3	13.96
Ap	1950	31,200	14,700	11,250	47,510	48,000	152,460	34,200	28,700	12,150	15,850	8,320	99,220	44,257	296,327	98.3	13.96
Ja	1951	35,336	15,892	13,017	55,631	52,143	172,019	35,949	29,148	12,859	15,833	8,416	102,205	47,283	320,689	105.7	15.01
Ap	1951	35,336	15,892	13,017	55,631	52,143	172,019	35,949	29,148	12,859	15,833	8,416	102,205	47,283	320,689	105.7	15.01
Ja	1951	35,336	16,271	13,571	57,650	53,114	176,342	36,358	31,285	12,853	15,823	8,450	104,769	47,763	324,551	108.9	15.19
Ap	1951	35,336	16,271	13,571	57,650	53,114	176,342	36,358	31,285	12,853	15,823	8,450	104,769	47,763	324,551	108.9	15.19
Ja	1951	35,336	16,271	13,571	54,667	53,114	173,359	37,764	31,285	12,853	16,118	8,295	113,074	48,457	326,306	108.2	15.26
O	1951	37,525	16,814	13,571	54,667	53,114	176,091	40,346	33,620	13,695	16,118	9,295	113,074	50,166	339,351	111.6	15.86
Ja	1952	37,525	16,804	13,571	53,539	56,104	177,543	40,346	33,620	13,695	16,118	9,295	113,074	50,382	340,989	112.3	15.96
Ap	1952	37,525	16,804	13,571	53,539	56,104	177,543	40,346	33,620	13,695	16,118	9,295	113,074	50,382	340,989	112.3	15.96
Ja	1952	37,525	16,804	13,571	54,176	55,647	177,723	40,346	33,620	13,695	16,974	9,295	113,590	50,581	342,234	112.7	16.01
O	1952	37,525	16,927	13,571	54,176	55,625	177,724	40,346	33,620	13,695	17,554	9,295	114,510	50,760	342,934	113.0	16.05
Ja	1953	37,525	16,927	13,571	54,176	55,525	177,724	40,846	33,620	13,695	17,554	9,859	115,574	50,921	344,219	113.4	16.11
Ap	1953	37,525	16,927	13,571	54,176	55,525	177,724	40,846	33,620	13,695	17,554	9,859	115,574	50,921	344,219	113.4	16.11
Ja	1953	38,051	17,654	13,927	53,339	58,768	181,239	40,846	33,620	13,695	17,554	9,859	115,574	51,393	346,180	114.7	16.29
O	1953	38,051	17,613	13,927	52,902	59,609	182,102	40,846	33,620	13,695	17,554	9,859	115,574	51,396	346,268	114.7	16.29
Ja	1954	38,114	17,746	14,114	52,902	59,609	182,485	40,846	33,620	13,695	17,554	9,859	115,574	51,566	349,625	115.2	16.36
Ap	1954	38,114	17,746	14,114	52,902	59,609	182,485	40,846	33,620	13,695	17,554	9,859	115,574	51,566	349,625	115.2	16.36
Ja	1954	38,114	17,746	14,114	52,386	59,944	182,256	40,846	33,620	14,250	17,554	9,859	116,129	51,648	350,033	115.3	16.38
O	1954	38,114	18,053	14,114	53,279	59,944	183,444	40,846	33,620	14,250	17,554	9,859	116,129	51,648	350,033	115.3	16.38
Ja	1955	38,114	18,053	14,114	53,279	59,944	183,444	41,195	33,620	14,353	17,692	9,859	116,719	51,920	352,093	116.0	16.47
Ap	1955	38,114	18,179	14,114	52,933	59,884	183,224	40,701	33,923	14,468	17,374	9,859	116,325	51,819	351,368	115.7	16.44

BRICK COMMERCIAL BUILDING



Content: 115,850 cubic feet
8,075 square feet

DESCRIPTIVE SPECIFICATIONS

GENERAL CONDITIONS

Materials, Labor, Appliances. Unless otherwise specified herein, the contractor shall provide and pay for all materials, labor, water, tools, equipment, permits, light and power necessary for the completion of the Wenzlick commercial building. Unless otherwise specified, all materials shall be sound, new and of good quality and all work shall be done in a skillful and workmanlike manner.

PREPARATION OF SITE AND EXCAVATION

The contractor shall clear the site of all trees, brush, etc. The excavation shall be of sufficient area and depth to accommodate the footings of the building. The ground to be enclosed by the foundation walls shall be leveled to receive a 3" cinder bed. Any surplus material not required to grade the plot as indicated by plans shall be removed from the premises and the shortage of materials shall be furnished by the contractor.

Rock excavation is not included in this contract. The contractor will be paid an additional price per cubic foot for rock removal as specified in his bid.

CONCRETE FOOTINGS, FOUNDATIONS AND FLOOR

Footings and foundation walls shall be installed to dimensions indicated on the plans. The mixture shall be one (1) part Portland Cement, three (3) parts clean sharp sand, five (5) parts broken stone, trap-rock, gravel or other suitable clean coarse aggregate, graded in size to pass through a 2" screen, adequately mixed with a sufficient amount of clean water in a mechanical batch mixer, placed in the forms within one-half hour thereafter. Substantial and tight forms shall be built on both inner and outer surface foundations of the walls. No part of the excavation wall shall be used as a form.

Reinforcing rods are to be placed in the foundation and footings as indicated on the detailed plans.

The floor of the building is to be 1:3:5 concrete poured over a 3" cinder bed. The concrete floor is to be 5" thick and is to be reinforced by 6 x 6 steel mesh.

BRICKWORK AND MASONRY ITEMS

Exterior walls are to be 13" variegated matt brick laid in Flemish bond and backed with common brick. The rear wall of the building is to be faced with common brick.

Interior partitions are to be curtain walls of 4" gypsum block.

STRUCTURAL STEEL

Structural steel work shall be 6 x 6 "H" columns supporting 10" "I" beams as indicated on the structural steel plans. Ceiling joists are to be 16" steel bar joists set on 54" centers. 2½" x 3½" x 1/4" angle iron 4 feet long shall form the lintel over each door and window in the rear wall.

PLASTERING

Contractor shall provide for 3-coat plastering of gypsum block partitions. The scratch coat shall be one (1) part lime putty and two (2) parts sand with proper proportions of fiber and sand added. The brown coat shall be one (1) part lime putty to three (3) parts sand, and the finish coat shall be one (1) part hard wall plaster to two (2) parts of hydrated lime. The ceilings shall be plastered three (3) coats over expanded metal lath, the first two coats to be the same as those placed on the walls. The finished coat of the ceilings shall be acoustical plaster.

ROUGH CARPENTRY AND FRAMING MATERIAL

Rough carpentry and framing material shall be the best grade provided in local practice. It may be yellow pine, white pine, fir or hemlock. All material shall be of sizes indicated.

Roof rafters, 2" x 6" - spaced 16" c to c
Studding for gable ends 2 x 4's - spaced 16" c to c

ROOF SHEATHING

The sheathing over the gable portion of the roof shall be #2 yellow pine dressed and not over 6" wide, securely fastened at each intersection by 2 6d nails. The sheathing over the flat portion of the roof is to be 2" metal edge gypsum plank.

ROOFING

The gable portion of the roof shall be covered with a good grade of variegated slate laid over 15-lb. roofing felt. The gable ends are to be covered with 10" beveled redwood siding. The flat portion of the roof is to be built-up asphalt and felt laid over the 2" metal edge gypsum plank and covered with roofing gravel.

FLASHING - SHEET METAL WORK - Same as 18-family brick apartment house.

MILLWORK - WINDOW FRAMES AND SASH - Same as 18-family brick apartment house.

MILLWORK - INTERIOR - Same as 18-family brick apartment house.

FINISHED FLOORS

Finished floors shall be of asphalt tile (Johns Manville group B or equivalent) 1/8" thick laid in mastic over the concrete floor.

PAINTING - Same as 18-family brick apartment house.

PLUMBING

This specification contemplates a complete plumbing, drainage and water-supply system for 5 lavatories and 5 toilets.

Sewer Line, Vents and Drainage. House sewer line of 6" shall be carried to a point 50 feet beyond foundation walls. Vent and drainage system shall be installed and tested in accordance with best local practice, municipal code, or requirements of American Society of Sanitary Engineers. All joints shall be filled with oakum and poured lead and well calked. 2" vent and waste lines shall be of genuine galvanized wrought iron. 6" vitrified tile pipe shall be continued beyond the foundation walls for 50 feet and the joints securely set with cement mortar. Plumber shall excavate and backfill all pipe trenches.

Water Supply. A pipe shall be continued 50 feet beyond the foundation walls in separate trench. This shall be laid using 1" copper water tubing with sweat-joint fittings. One-half inch copper tubing with sweat-joint pipe and fitting shall be installed for hot and cold water supply and connected with all plumbing fixtures and boiler. (Water closets and boiler shall be provided with cold-water supply only.) All pipe and fitting shall be installed in accordance with manufacturer's instructions.

Fixtures. There shall be furnished and installed to the rough connections here provided fixtures of quality equal to those specified in the following list: (The following list covers items manufactured by the Independent Plumbing and Heating Company. Contractor is permitted to substitute any equal combination.)

- 5 - Knight Pedestal Lavatories 20" x 24" over all #224
- 5 - Colonial Vitreous China Toilets with white ivoryette seat #344

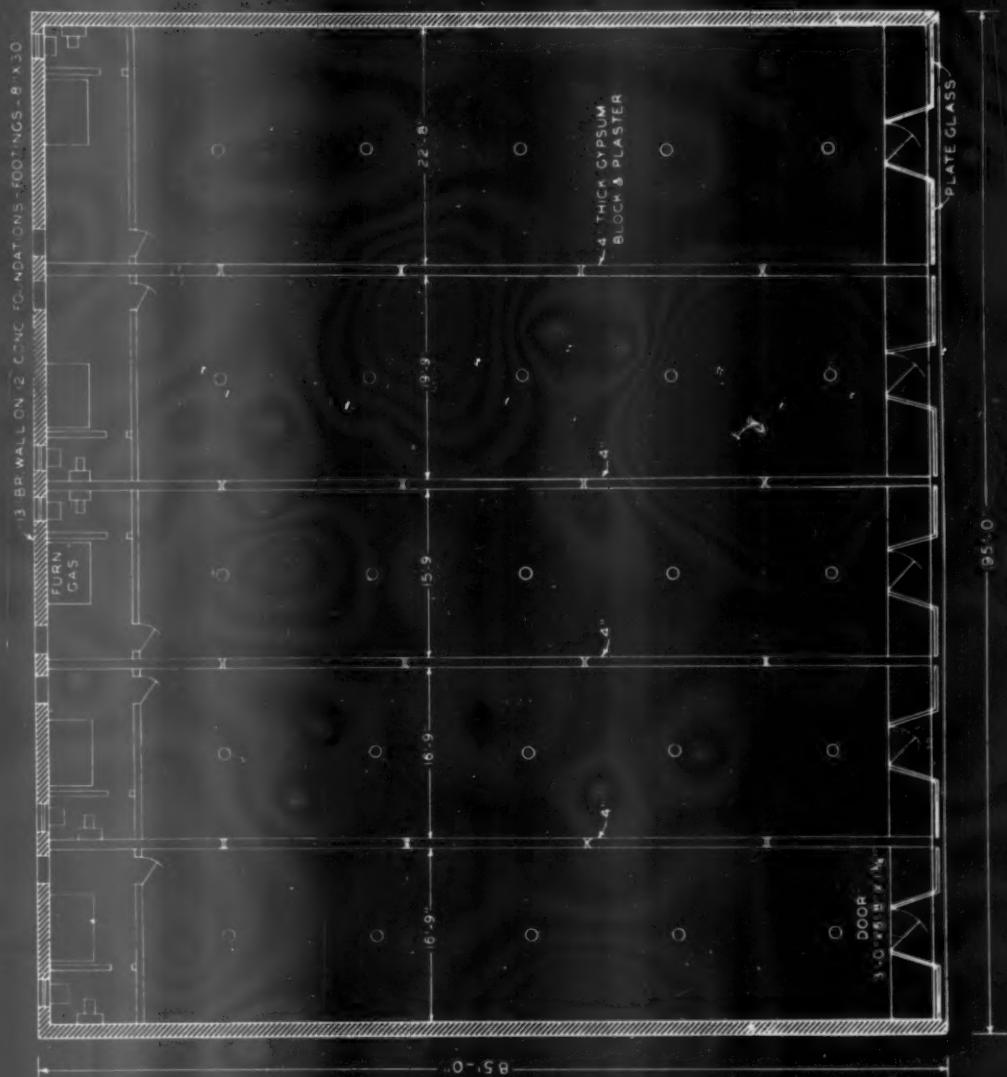
Hot Water Supply. A water heater is not provided under these specifications. It is to be provided under separate order on selection by the owner.

Alternates. Same as 18-family brick apartment house.

HEATING PLANT

The purpose of this specification is to describe complete installation of 5 gas-fired forced warm air furnaces. Furnaces are to be three 80GH, one DL2100 and one DL3125 Front Rank furnaces or equivalent. Duct work and registers are to be provided in the manner indicated on the heating plans. Each furnace shall be tested as required and left complete.

ELECTRIC WIRING - Same as 18-family brick apartment house.



FLOOR PLAN

(6) Heating: 5 gas-fired furnaces and metal for duct work.

(12) Miscellaneous: Metal lath, mineral wool insulation.

TOTAL CONSTRUCTION COST

TOTAL CONSTRUCTION COST

GROUP A										GROUP B										GROUP C										GROUP D										GROUP E									
Year	(1)		(3)		(4)		(5)		(6)		(7)		(8)		(9)		(10)		(11)		(12)		(13)		Cu. ft. cost	Sq. ft. cost																							
	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L	M	L																									
1939	\$370	\$251	\$2303	\$759	\$3314	\$306	\$607	\$258	\$747	\$542	\$603	\$325	\$58	\$44	\$52	\$77	\$83	\$46	\$54	\$316	\$310	\$12009	\$5127	\$5890	\$27226	\$3.83	82																						
1939	3872	2611	2964	767	3373	679	241	778	564	583	394	75	44	61	87	85	56	67	245	245	13009	5127	5890	24226	3.01	30																							
1941	4107	3353	4672	1072	3245	437	706	335	701	1015	578	443	126	75	66	109	87	63	78	385	276	14327	5318	923	28264	3.10	31																						
1942	4108	3218	2681	984	3538	400	714	300	789	1015	592	385	67	75	98	103	64	75	385	259	13143	5017	9114	26719	3.31	33																							
1943	4108	3003	2705	901	3756	361	714	269	819	632	583	385	67	51	98	97	103	64	404	258	13425	5017	9114	25893	3.21	32																							
1944	4108	3374	2713	901	3756	361	701	269	817	632	583	409	67	51	98	97	103	64	60	417	307	13425	5017	9114	25893	3.21	32																						
1945	4543	4685	2711	1552	3669	634	841	470	819	632	601	644	67	51	98	153	103	64	99	417	411	13933	9321	7884	31138	3.26	32																						
Ja 1946	4578	4926	2754	1631	3872	660	841	502	834	948	610	660	71	75	98	168	103	64	105	417	394	14323	10059	8357	32968	3.26	32																						
Ap 1946	4781	5202	2901	1631	3884	660	841	502	834	948	629	660	71	75	98	179	103	64	105	417	394	14323	10059	8357	32968	3.26	32																						
Jul 1946	4904	5276	2850	1762	4021	720	856	551	880	948	681	660	71	75	120	179	106	69	105	417	394	14872	10670	8746	34386	3.26	32																						
O 1946	5047	5276	2852	1762	4092	720	972	551	946	948	681	660	71	75	137	179	106	69	105	431	505	15456	10812	8975	35243	3.4	34																						
Ja 1947	5216	5020	2419	1851	5239	763	1103	566	1101	948	825	825	122	75	144	179	151	141	136	538	533	10689	11709	9927	36825	3.3	33																						
Ap 1947	5408	5020	2425	1851	5093	763	1112	566	1114	948	813	825	122	75	152	179	174	141	136	538	533	10791	11709	9953	38753	3.3	33																						
Jul 1947	5538	5020	2440	1851	4983	763	1112	566	1114	948	836	825	130	75	148	179	174	135	136	538	533	10791	11709	9964	38941	3.3	33																						
O 1947	5666	5020	2447	1851	4966	763	1102	569	1219	948	911	825	136	75	148	179	176	133	136	535	533	10759	11709	10238	39460	3.4	34																						
Ja 1948	5941	6065	2486	1914	4583	780	1205	599	1292	948	1081	924	136	75	167	191	180	133	131	611	533	12615	12160	10341	40316	3.4	34																						
Ap 1948	5968	6065	2496	1914	4949	780	1280	599	1324	948	1089	924	136	75	167	191	180	133	131	611	533	12615	12160	10322	41001	35.4	5.08																						
Jul 1948	6004	6897	2507	1914	4949	780	1148	599	1318	948	1097	924	136	75	168	191	180	144	131	611	538	12621	12364	10468	41514	35.8	5.14																						
O 1948	6170	8199	2507	2912	5105	780	1148	599	1415	948	1161	924	135	104	168	191	180	144	131	618	538	12862	12584	10468	41514	35.8	5.14																						
Ja 1949	6336	8994	2663	2912	5455	1212	1300	896	1695	1234	1173	1063	163	152	176	309	199	152	102	650	806	19977	17790	17271	55038	47.5	6.82																						
Ap 1949	6313	8994	2765	2912	5272	1212	1305	896	1695	1234	1088	1063	163	152	176	309	199	152	102	650	806	19977	17790	17193	54633	47.2	6.77																						
Jul 1949	6303	8994	2755	2912	4883	1212	1291	896	1695	1234	976	1063	163	152	176	309	199	151	192	673	806	19256	17790	17108	54154	46.7	6.71																						
O 1949	6303	8994	2768	2912	5240	1212	1243	896	1695	1234	1038	1063	163	152	176	309	199	151	192	673	806	19256	17790	17262	54692	47.2	6.78																						
Ja 1950	6303	8994	2768	2912	5240	1212	1243	896	1695	1234	1026	1063	163	152	175	309	199	151	192	673	806	19828	17790	17133	54551	47.1	6.76																						
Ap 1950	6303	8994	2805	2912	5327	1212	1304	896	1599	1234	988	1063	163	152	160	309	200	143	192	673	806	19707	17790	17152	54649	47.2	6.67																						
Jul 1950	6519	8991	2910	2937	5392	1228	1304	913	1599	1234	976	1063	163	152	160	309	200	143	192	673	806	19707	17790	17152	54649	47.2	6.67																						
O 1950	6793	9455	2868	2983	5408	1228	1438	9	1694	1234	1135	1063	163	152	160	309	200	143	192	673	806	19707	17790	17152	54649	47.2	6.67																						
Ja 1951	6793	9455	2868	2983	5408	1228	1438	9	1694	1234	1135	1063	163	152	160	309	200	143	192	673	806	19707	17790	17152	54649	47.2	6.67																						
Ap 1951	6793	9455	2868	2983	5408	1228	1438	9	1694	1234	1135	1063	163	152	160	309	200	143	192	673	806	19707	17790	17152	54649	47.2	6.67																						
Jul 1951	6793	9455	2868	2983	5408	1228	1438	9	1694	1234	1135	1063	163	152	160	309	200	143	192	673	806	19707	17790	17152	54649	47.2	6.67																						
O 1951	6793	9455	2868	2983	5408	1228	1438	9	1694	1234	1135	1063	163	152	160	309	200	143	192	673	806	19707	17790	17152	54649	47.2	6.67																						

Ja 1951	6856	9454	3080	2982	5448	1226	1438	913	1766	1234	1178	1083	155	152	169	309	200	143	192	701	806	2144	18351	18251	57736	49.8
Ap 1951	6885	9581	3104	3006	5401	1226	1527	913	1766	1234	1264	1083	137	94	171	278	201	143	192	749	760	21448	18367	18357	58172	50.2
Ji 1951	6985	9581	3077	3006	5344	1226	1527	913	1811	1234	1261	1097	137	94	171	278	201	143	192	749	760	21406	18381	18279	58066	50.7
O 1951	7102	10321	3077	3157	5335	1270	1523	962	1811	1234	1261	1118	137	94	171	278	201	143	192	749	888	21510	19514	18826	59950	51.7
Ja 1952	7226	10321	3070	3157	5452	1270	1523	962	1818	1234	1246	1118	137	94	169	278	201	143	216	749	888	21734	19538	19033	60305	52.1
Ap 1952	7226	10321	3070	3157	5454	1270	1523	962	1818	1234	1246	1145	131	83	235	309	201	148	216	749	888	21791	19585	19076	60452	52.2
Ji 1952	7278	10321	3070	3157	5454	1270	1466	962	1807	1234	1089	1145	105	71	235	309	201	148	216	749	888	21602	19573	18994	60169	52.4
O 1952	7278	10321	3179	3157	5401	1270	1466	962	1807	1278	1099	1145	105	71	234	339	201	148	216	749	888	21667	19647	19076	60390	52.1
Ja 1953	7278	10459	3188	3157	5401	1270	1466	962	1803	1278	1099	1219	194	132	234	339	201	148	216	749	888	21761	19920	19253	60934	52.6
Ap 1953	7464	10459	3197	3157	5510	1270	1523	962	2000	1278	1075	1219	210	143	236	339	216	148	216	749	888	22328	19831	19507	61766	53.3
Ji 1953	7464	10459	3484	3157	5556	1270	1523	962	1750	1278	1054	1219	218	149	234	339	216	146	216	757	888	22504	19837	19573	62014	53.5
O 1953	7464	10459	3471	3157	5532	1270	1523	962	1779	1278	1090	1219	218	149	234	339	216	146	216	817	888	22490	19837	19583	62010	53.5
Ja 1954	7546	10458	3470	3158	5531	1270	1523	962	1779	1279	1090	1219	218	149	234	339	216	146	216	768	888	22521	19838	19604	62063	53.6
Ap 1954	7682	10655	3463	3158	5531	1270	1503	962	1779	1279	1099	1219	218	149	234	339	216	185	216	768	888	22639	20135	19700	62474	53.9
Ji 1954	7682	10655	3463	3158	5385	1270	1503	962	1779	1279	1089	1219	218	149	234	339	216	146	216	768	888	22474	20135	19735	62344	53.8
O 1954	7682	10655	3476	3158	5386	1270	1503	962	1779	1279	1106	1219	218	149	234	339	216	146	216	768	888	22494	20135	19739	62388	53.8
Ja 1955	7682	10656	3477	3158	5387	1270	1503	962	1779	1279	1106	1219	218	149	234	339	216	146	216	768	888	22496	20136	19746	62378	53.8
Ap 1955	7732	10656	3477	3158	5387	1270	1508	962	1779	1279	1120	1219	218	149	234	339	216	146	216	768	888	22585	20136	19676	62397	53.9

CONSTRUCTION COSTS OF A ONE-STORY COMMERCIAL BUILDING

WE have used the following method of estimating the reproduction cost of a one-story commercial building and have found it very effective. We hope that you, too, will find it useful. You will notice that it is similar to the previously published method of estimating the reproduction cost of single-family residences and garages.

In this instance we show two lines on the chart on pages 81 and 82. The red line shows the cost of the exterior walls, including footings, foundation, masonry wall, windows and exterior doors and the plaster on the inside of the exterior walls. In a building of this type the exterior walls will cost \$55.50 per running foot, so in a 40 x 60 building (200-foot perimeter), the exterior walls will cost \$11,100.

The other line on the chart shows the cost of all other items in the building except partitions, plumbing and heating costs. In other words, the blue line shows the total cost of the concrete slab (there is no basement), the asphalt tile flooring, the ceiling, insulation, steel bar joists, roof planking, roofing, electrical work, and structural steel. In this instance it amounts to a unit cost of \$3.72 per square foot of ground area.

Therefore, a 40 x 60 building, with a perimeter of 200 feet and an area of 2,400 square feet, will cost $(200 \text{ feet} \times \$55.50) + (2,400 \text{ square feet} \times \$3.72)$, or $\$11,100 + \$8,925 = \$20,025$. To this total figure you must add the cost of the partitions, plumbing and heating, as indicated by the table of "additional costs." This table appears on the chart on page 19. Upon looking at the chart you will see that you can read the cost of the walls (\$11,100) directly off the red line, and the cost of the floor, ceiling, structural steel, etc. (\$8,925) directly off the blue line.

For greatest accuracy we recommend that you not use these costs for buildings with bays wider than 25 feet. When you get into a wider bay, heavier structural steel is required and the cost goes up accordingly. You should also keep in mind that these costs do not include a basement.

(cont. on page 83)

Briefly, the specifications of the type of building covered by these costs are as follows:

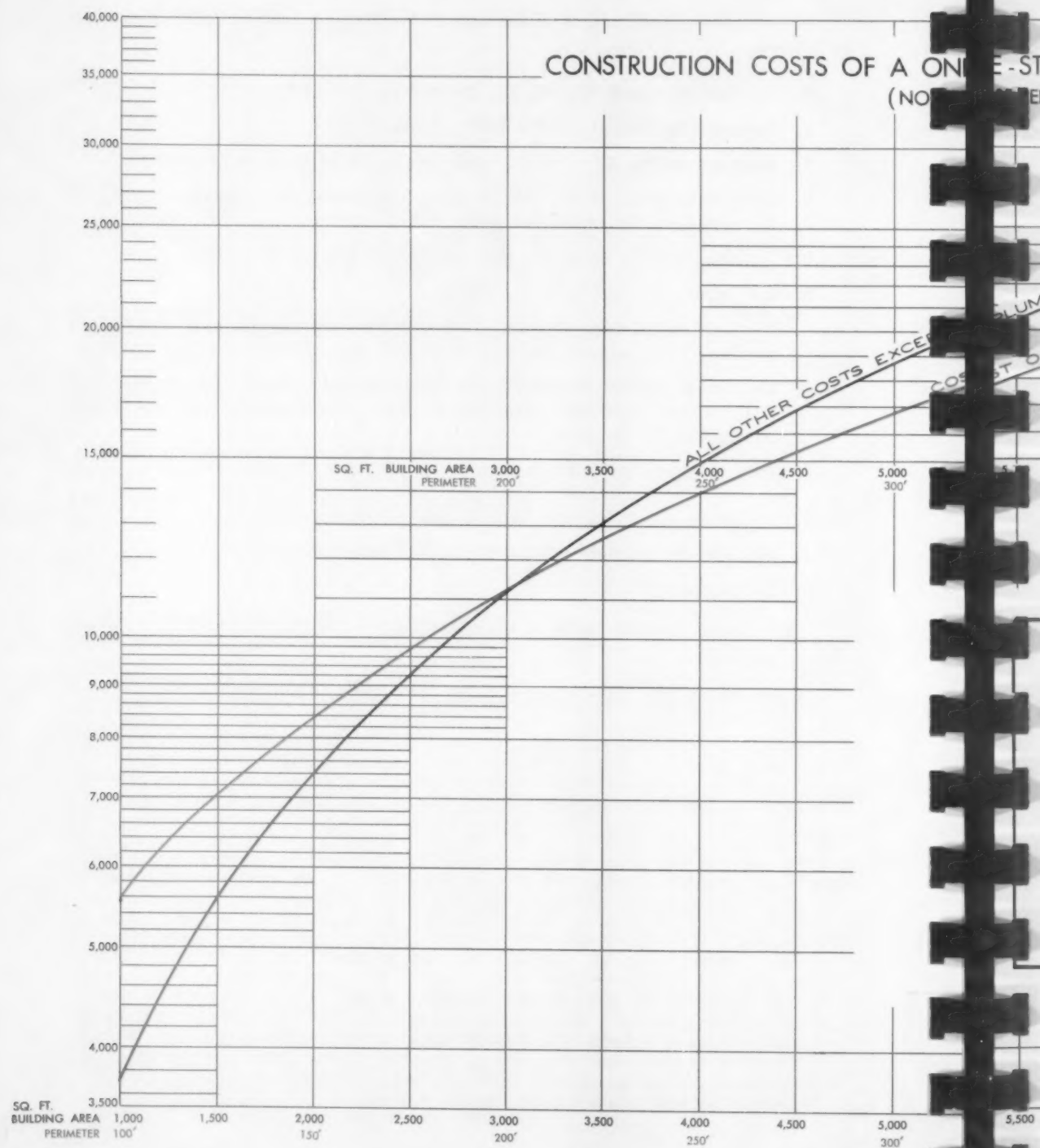
1. Reinforced concrete footings, foundation, and slab.
2. Asphalt tile floor (type B - 1/8" thick).
3. Masonry walls, 13 " thick, with face brick on front and two sides.
4. Structural steel, 6 x 6 "H" columns supporting 10" I beams which, in turn, support 16" steel bar joists 54" on center.
5. Plaster, 3 coats on walls, with acoustical plaster on ceiling.
6. Insulation, 4" rock wool in ceiling.
7. Roof, 2" metal edge gypsum plank with built-up asphalt, felt, and gravel roofing. The gabled roof is covered with variegated slate over 15# felt.
8. Electrical system, flexible conduit (BX or equivalent), with toggle-type switches and approved metal outlet boxes. No fixtures or appliances are covered by these costs.
9. Partitions not included in base costs; add as required.
10. Plumbing not included in base costs; add as required.
11. Heating not included in base costs; add as required.
12. Ceiling height = 12' .

Here is the way the costs on such buildings of various sizes work out in the St. Louis Area.

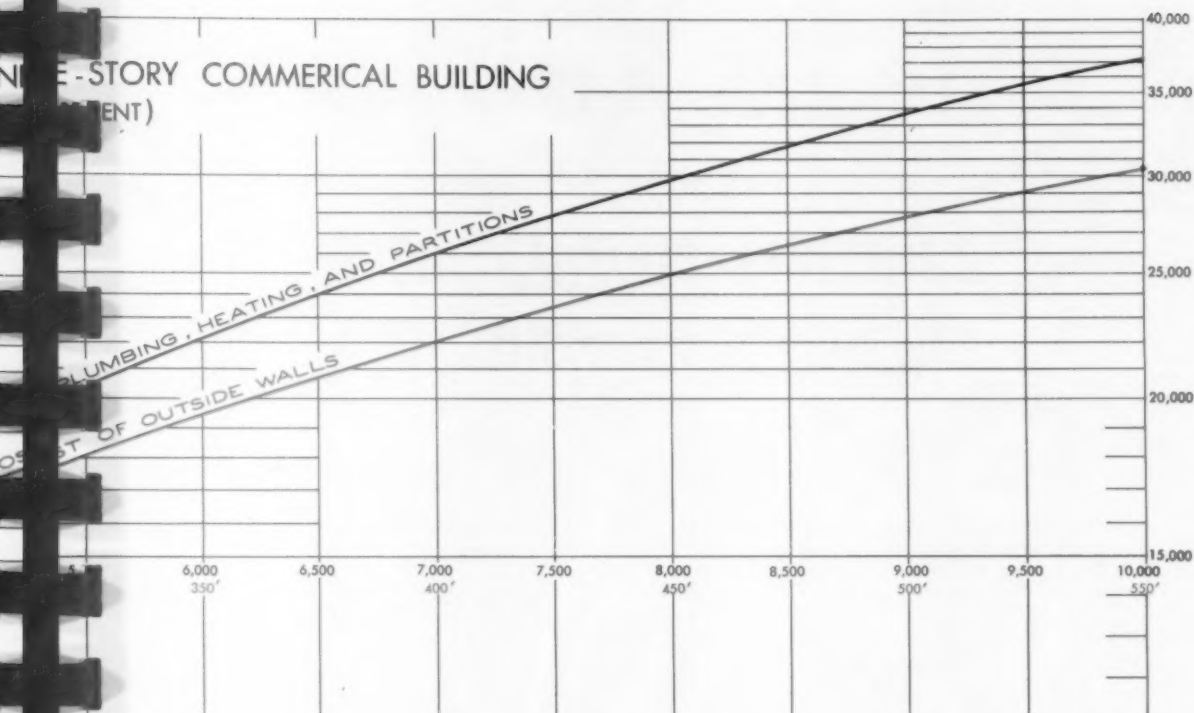
Per-imeter	Area	Per-imeter Costs	Area Costs	Sub-total	Plumbing and Heating	Partitions*	Total Cost	Cost Per Sq. Ft.
100'	600	\$ 5,550	\$ 2,232	\$ 7,782	\$1,220	\$190	\$ 9,192	\$15.30
150'	1,350	8,325	5,022	13,347	1,640	285	15,272	11.30
200'	2,400	11,100	8,928	20,028	2,290	380	22,698	9.45
250'	3,750	13,875	13,950	27,825	3,450	475	31,750	8.45
300'	5,400	16,650	20,088	36,738	4,400	570	41,708	7.70
350'	7,350	19,425	27,342	46,767	5,850	665	53,282	7.25
400'	9,600	22,200	35,712	57,912	7,050	760	65,722	6.85

* For the purpose of this example, partition is assumed to be 10' high and to extend the width of the building and to be plastered on both sides.

CONSTRUCTION COSTS OF A ONE-STORY BUILDING (NOT INCLUDING LAND)



FIVE-STOREY COMMERCIAL BUILDING (RENT)



ADDITIONAL COSTS

Gypsum Block Partitions - No plaster	39¢ per sq. ft.	\$3.50 per sq. yd.
Gypsum Block Partitions - 3-coat plaster on 1 side	67¢ per sq. ft.	\$6.05 per sq. yd.
Gypsum Block Partitions - 3-coat plaster on 2 sides	95¢ per sq. ft.	\$8.55 per sq. yd.

PLUMBING

For service lines and 1 fixture add \$530.00
 For each additional fixture add \$340.00
 (6 fixtures = \$530.00 + 5 x \$340.00 or \$2,230.00)

HEATING

For forced warm air heat in climate similar to St. Louis
 add from 55¢ per sq. ft. ground area (10,000 sq. ft. bldg.)
 to 70¢ per sq. ft. ground area (1,000 sq. ft. bldg.)

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**CONSTRUCTION COST DATA
FOR
MISCELLANEOUS BUILDINGS
AND OTHER IMPROVEMENTS**

CUBIC FOOT COSTS ON SIX TYPES OF BUILDINGS

ON the following pages are sketches and the latest cubic foot cost estimates on six types of properties. Following are the specifications for each type.

Old-style two-family building - built 1895-1900 - two-story and basement with stone front, containing two dwelling units eight rooms each; foundation 18" rubble stone; side and rear walls 13" common brick; interior partitions wood lath and plaster; pine trim; hardwood floors; tar and gravel roof; steam heating; average plumbing and linoleum in bathrooms and kitchens.

Four-family building - built 1900-20 - two-story and full basement brick, containing four units four rooms each; foundation 18" rubble stone; exterior walls 13" variegated matt brick, backed with 5 x 8 x 12 tile; 13" brick fire wall through building; interior partitions lath and plaster; pine trim; hardwood floors; mansard roof with Spanish tile, tar and gravel on back; tile in baths; four gravity warm air furnaces; average-quality plumbing fixtures.

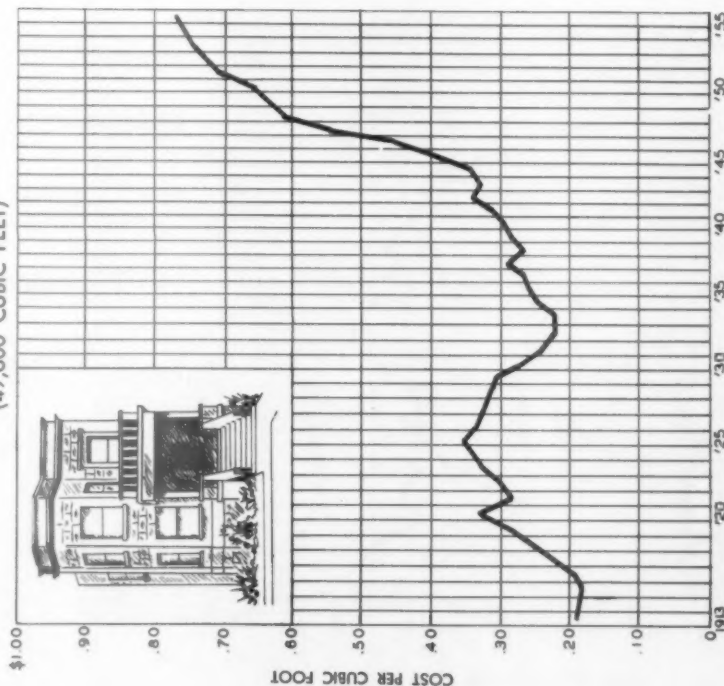
Combination residential and commercial building - two-story and full basement brick building with store on first and six-room dwelling unit on second; foundation 18" rubble stone; outside walls 13" common brick; interior partitions lath and plaster; birch and gum trim; hardwood floors; tar and gravel roof; steam heating system; average-quality plumbing fixtures.

Two-story store and flat building - two-story and full basement brick building with stores on first floor and apartments on second floor; foundation poured concrete; exterior walls 13" brick with face brick on front and one side; brick fire walls separate apartments on second floor; store fronts plate glass in copper moulding; interior partitions lath and plaster; yellow pine trim; hardwood floors; tar and gravel roof; average-quality heating, plumbing and electrical systems.

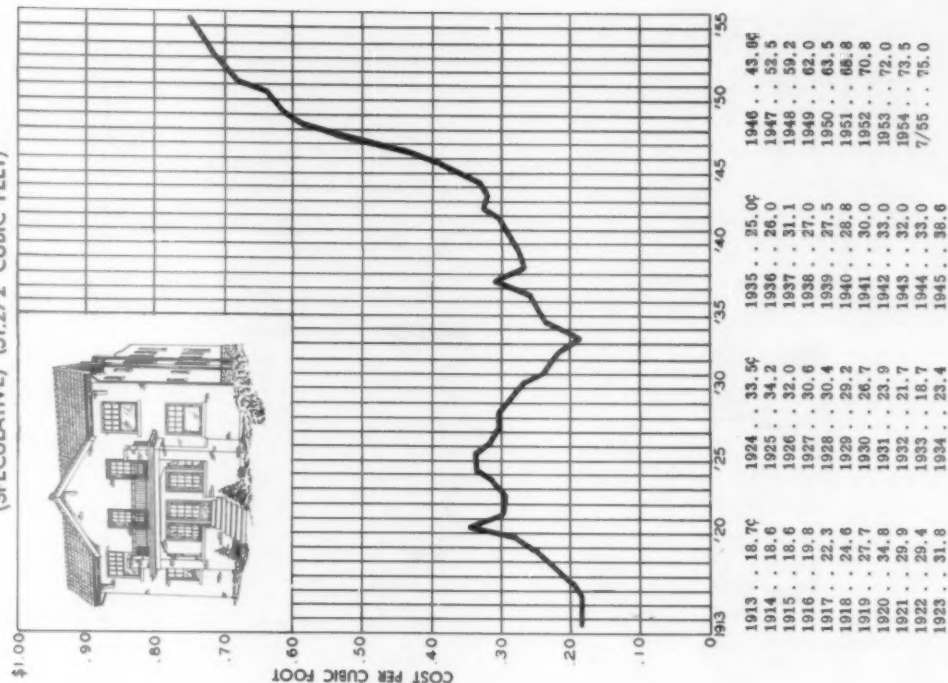
Mill-type loft building - five-story and full basement brick building; foundations poured concrete; exterior walls load-bearing brick with stone trim and face brick on front and one side; wood window frames and sash; interior partitions plaster over tile; hardwood floors, timber girders; brick fire walls with double fire doors; tar and gravel built-up roof; average-quality plumbing, heating and electrical systems; sprinkler system throughout building.

Old-style office building - eight-story and full basement brick building; foundation rubble stone; structural frame, steel beams and girders; exterior walls, curtain walls; face brick on front wall; plaster walls and ceilings; tile interior partitions; maple floors over arched tile; mosaic tile floor lobby with marble wainscoting; one-pipe steam heating; marble floors and wainscoting in toilet rooms.

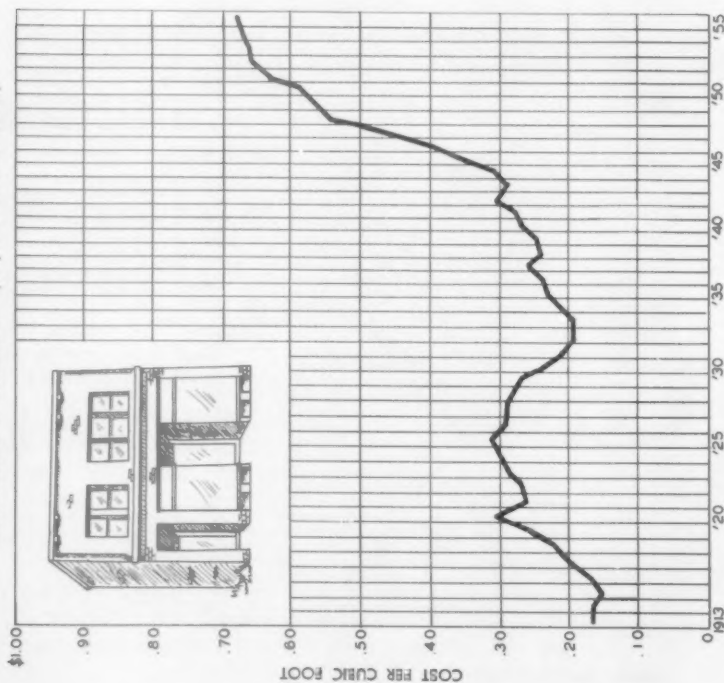
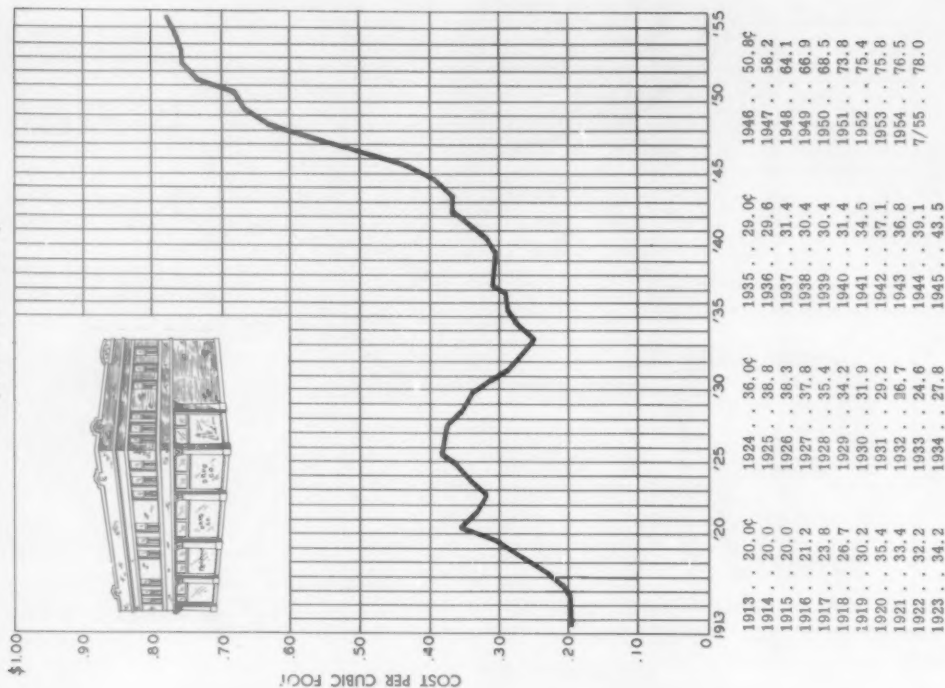
CUBIC FOOT COST OF AN OLD STYLE TWO-FAMILY BUILDING
(49,600 CUBIC FEET)



CUBIC FOOT COST OF A FOUR-FAMILY BUILDING
(51,272 CUBIC FEET)

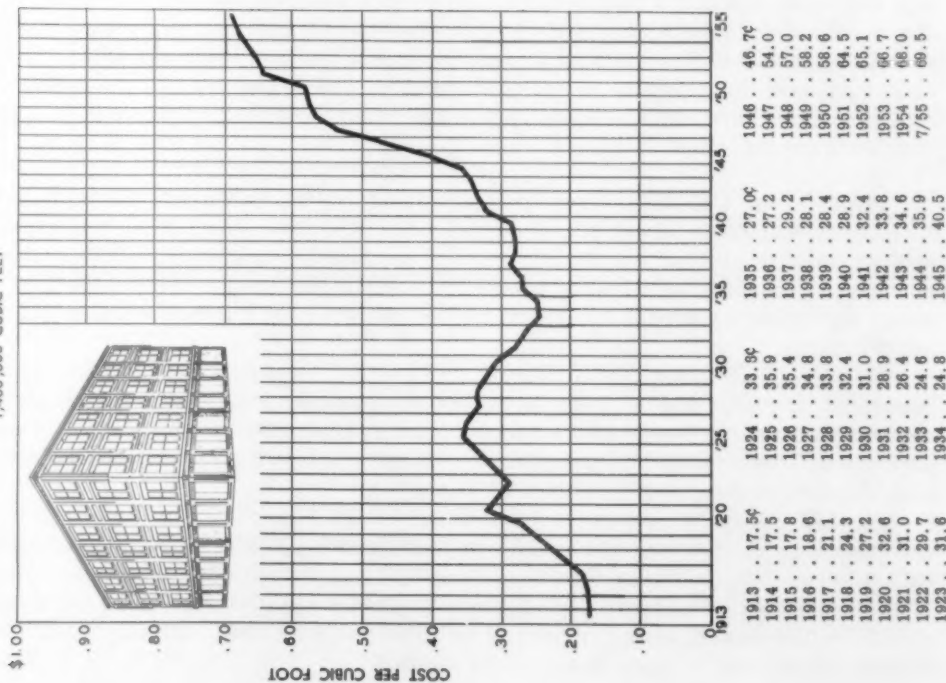


CUBIC FOOT COST OF A COMBINATION RESIDENTIAL & COMMERCIAL BUILDING (57,750 CUBIC FEET)

CUBIC FOOT COST OF A 2 STORY STORE & FLAT BLDG.
82,500 CUBIC FEET

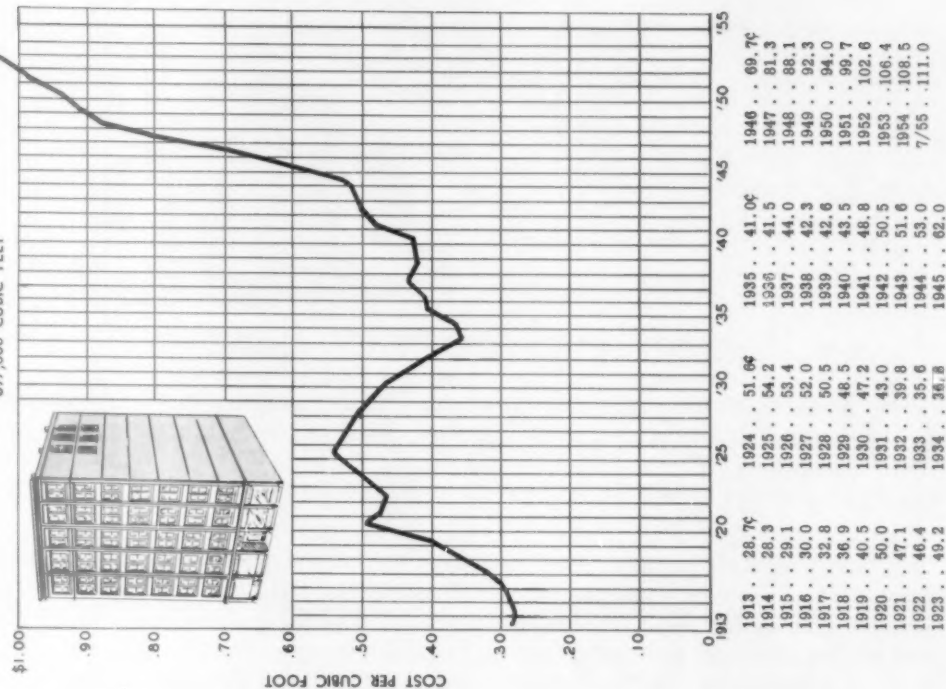
CUBIC FOOT COST OF A MILL TYPE LOFT BLDG.

1,400,000 CUBIC FEET



CUBIC FOOT COST OF AN OLD STYLE OFFICE BLDG.

697,000 CUBIC FEET



CONSTRUCTION COSTS OF CHURCHES

ON the following pages are charts and tables showing the cubic foot cost of three types of churches - frame, masonry with frame interior, and fireproof. The original cost is known for each of these buildings, and the figures shown have been brought up to date on a carefully computed index.

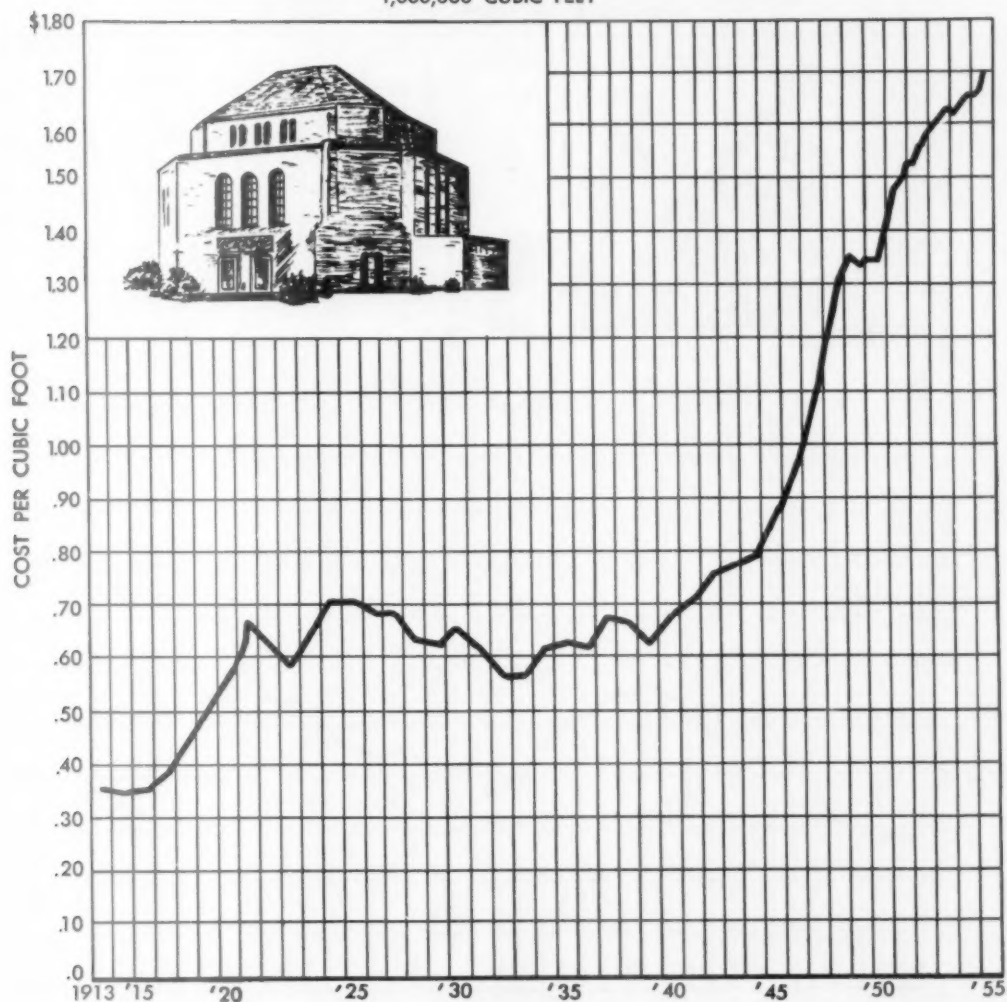
Churches, as a general rule, are very difficult to appraise. They present most of the problems common to special use properties and can usually be appraised only by the replacement cost method. The income approach is useless, and the comparative method is seldom feasible because churches differ so widely in size, shape, and quality of construction. Fortunately, most church appraisals are made for insurance purposes and not for determining market value. Most of the requests we receive for church cost information come from clients who are members of either the financial or building committees of their churches. In the first instance, the problem is one of insurance, and in the second, the construction of a new church or of an addition to the present edifice. The specifications for the three buildings follow:

FIREPROOF CHURCH: concrete foundations; partial basement; exterior walls, face brick with stone trim; stained glass windows; roof, slate over steel truss; copper flashing and gutters; floors, tile and hardwood over claytile filled concrete; partitions plaster over tile, or metal lath; ceilings, suspended plaster; birch doors and trim; vacuum steam heating; steel boiler; good grade of modern plumbing facilities.

MASONRY CHURCH WITH FRAME INTERIOR: concrete foundations; partial basement; exterior walls, stone; stained glass windows; roof, slate; copper flashing and gutters; hardwood and linoleum floors; trim and doors, birch and oak; partitions, stud, metal lath and plaster; ceilings plastered; steam heating with steel boiler; modern plumbing facilities of fair grade.

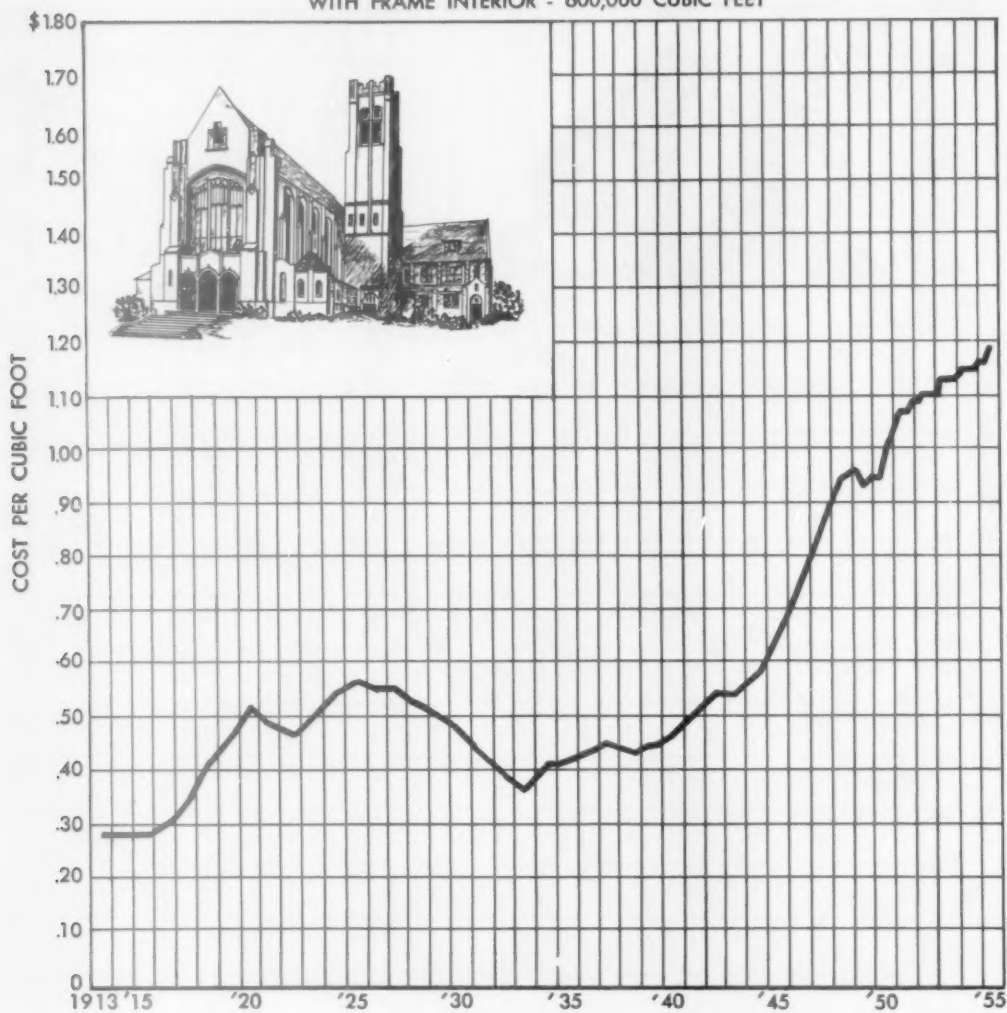
FRAME CHURCH: concrete foundation, partial basement; walls, drop siding and sheathing over studs; roof, slate; copper flashing and gutters; steam heating with steel boiler; hardwood floors; partitions, stud, wood lath and plaster; ceiling in auditorium exposed beam and sheathing; other rooms have plastered ceilings; pine trim and doors; modern plumbing facilities of fair grade. (Organ and kitchen equipment are not included in any of the costs.)

CUBIC FOOT COST OF A FIREPROOF CHURCH 1,000,000 CUBIC FEET



1913 . . \$0.36	1927 . . \$0.69	1941 . . \$0.71	Oct. '52 \$1.58
1914 . . 0.35	1928 . . 0.64	1942 . . 0.76	Jan. '53 1.59
1915 . . 0.36	1929 . . 0.63	1943 . . 0.78	Apr. '53 1.61
1916 . . 0.39	1930 . . 0.66	1944 . . 0.79	July '53 1.62
1917 . . 0.45	1931 . . 0.62	1945 . . 0.87	Oct. '53 1.63
1918 . . 0.51	1932 . . 0.57	1946 . . 0.97	Jan. '54 1.62
1919 . . 0.57	1933 . . 0.57	1947 . . 1.28	Apr. '54 1.63
1920 . . 0.68	1934 . . 0.62	1948 . . 1.31	July '54 1.64
1921 . . 0.63	1935 . . 0.63	1949 . . 1.34	Oct. '54 1.65
1922 . . 0.59	1936 . . 0.62	1950 . . 1.39	Jan. '55 1.65
1923 . . 0.66	1937 . . 0.68	1951 . . 1.50	Apr. '55 1.66
1924 . . 0.71	1938 . . 0.67	Jan. '52 1.53	July '55 1.70
1925 . . 0.71	1939 . . 0.63	Apr. '52 1.56	
1926 . . 0.69	1940 . . 0.68	July '52 1.58	

CUBIC FOOT COST OF A MASONRY CHURCH WITH FRAME INTERIOR - 600,000 CUBIC FEET



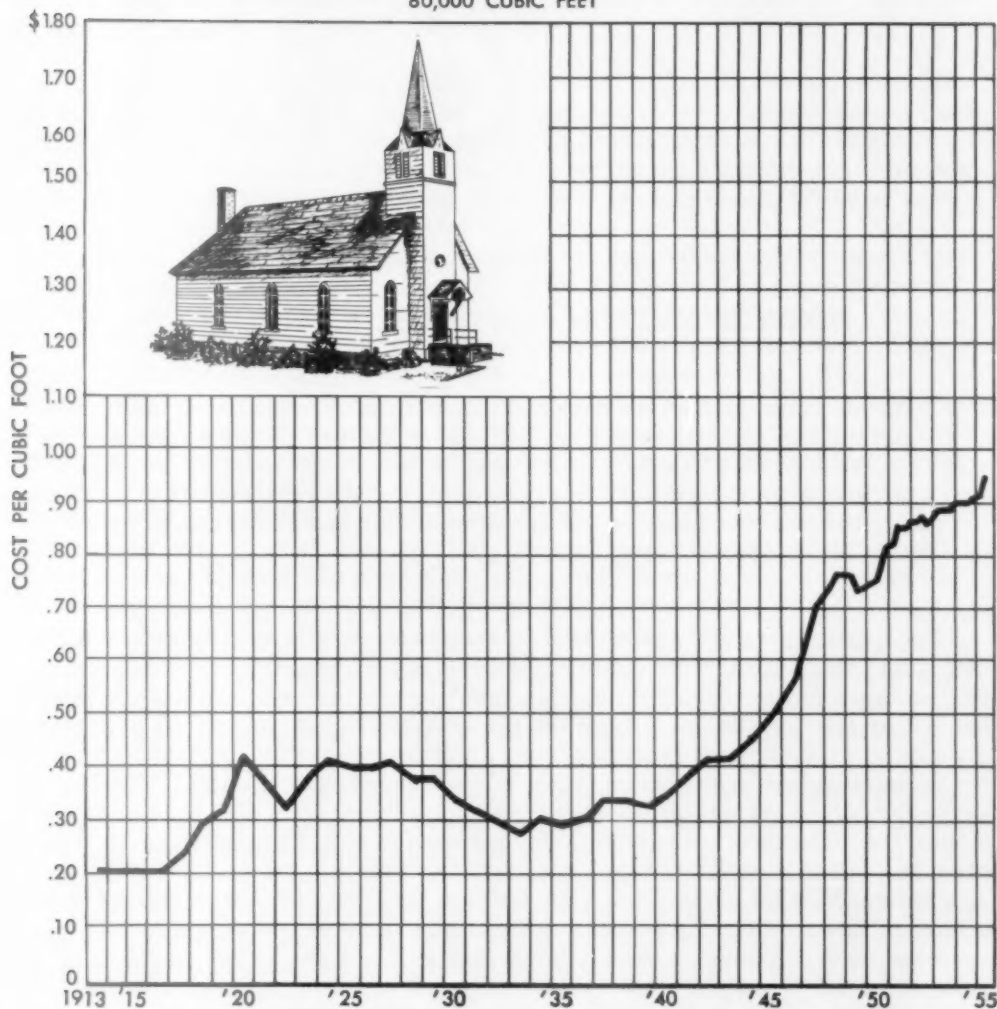
1913 . . \$0.29
1914 . . 0.29
1915 . . 0.29
1916 . . 0.31
1917 . . 0.35
1918 . . 0.42
1919 . . 0.46
1920 . . 0.53
1921 . . 0.49
1922 . . 0.47
1923 . . 0.51
1924 . . 0.55
1925 . . 0.57
1926 . . 0.56

1927 . . \$0.56
1928 . . 0.53
1929 . . 0.51
1930 . . 0.48
1931 . . 0.44
1932 . . 0.40
1933 . . 0.37
1934 . . 0.41
1935 . . 0.43
1936 . . 0.44
1937 . . 0.46
1938 . . 0.44
1939 . . 0.45
1940 . . 0.47

1941 . . \$0.51
1942 . . 0.55
1943 . . 0.55
1944 . . 0.58
1945 . . 0.65
1946 . . 0.75
1947 . . 0.86
1948 . . 0.95
1949 . . 0.94
1950 . . 1.00
1951 . . 1.08
Jan. '52 1.10
Apr. '52 1.11
July '52 1.11

Oct. '52 \$1.11
Jan. '53 1.11
Apr. '53 1.13
July '53 1.13
Oct. '53 1.13
Jan. '54 1.14
Apr. '54 1.15
July '54 1.15
Oct. '54 1.15
Jan. '55 1.16
Apr. '55 1.16
July '55 1.19

CUBIC FOOT COST OF A FRAME CHURCH 80,000 CUBIC FEET



1913 . . \$0.21	1927 . . \$0.41	1941 . . \$0.39	Oct. '52 \$0.87
1914 . . 0.21	1928 . . 0.38	1942 . . 0.42	Jan. '53 0.88
1915 . . 0.21	1929 . . 0.38	1943 . . 0.42	Apr. '53 0.89
1916 . . 0.21	1930 . . 0.34	1944 . . 0.45	July '53 0.89
1917 . . 0.24	1931 . . 0.32	1945 . . 0.50	Oct. '53 0.89
1918 . . 0.30	1932 . . 0.30	1946 . . 0.56	Jan. '54 0.90
1919 . . 0.33	1933 . . 0.28	1947 . . 0.71	Apr. '54 0.90
1920 . . 0.42	1934 . . 0.31	1948 . . 0.77	July '54 0.90
1921 . . 0.38	1935 . . 0.30	1949 . . 0.74	Oct. '54 0.91
1922 . . 0.33	1936 . . 0.31	1950 . . 0.80	Jan. '55 0.91
1923 . . 0.38	1937 . . 0.34	1951 . . 0.86	Apr. '55 0.92
1924 . . 0.41	1938 . . 0.34	Jan. '52 0.87	July '55 0.95
1925 . . 0.40	1939 . . 0.33	Apr. '52 0.87	
1926 . . 0.40	1940 . . 0.35	July '52 0.88	

SERVICE STATION CONSTRUCTION COSTS

THE following discussion deals with the costs of reproducing the service station and its improvements, as this is the key to the summation approach to value. We have found that the value concluded by the summation approach in some appraisals has been too low. The reason for this has been primarily the fact that many of the so-called minor though expensive yard improvements have been omitted.

The construction costs of service stations have risen to such an extent in recent years that the gasoline distributing business of the major oil companies as well as many of the so-called cut-rate firms has gone to proportionately fewer but larger service stations. Since the end of World War II the number of service stations in existence has remained fairly constant, despite the fact that the number of automobiles on the street today has increased substantially. In order to serve the increased automobile population it has been necessary to increase the size of the stations as long as the policy has been to retard the number of stations because of the high construction costs. This postwar era has been characterized by a tremendous increase in cut-rate stations, particularly those with numerous pumps. These multipump stations generally have many more pumps than they have employees to service them. Nevertheless, they do serve a psychological purpose in that the impatient American motorist can drive up to a pump without waiting in line. Despite this fact, many customers have to wait equally as long to get service because of the lack of manpower.

The service station structure varies considerably, ranging from the economy-priced, small office station without service facilities to the large, elaborate self-service station with extensive service facilities. We believe that the trend in service station operations shortly will be to limited services, as the major oil companies which own a large percentage of the service stations in this country and lease them to the operator receive but little benefit from the investment that they have in the high-priced lubritorium and service bays. Since their lease to the operator is primarily based on a gasoline gallonage basis, the benefits derived from the lubritoriums, wash racks, etc., by the owners are small. Practically all of

the cut-rate stations offer merely the sale of gasoline and oil and do not solicit grease jobs or other service facilities.

BUILDING COSTS: Even the smallest and least expensive of the service stations have a high unit cost because of their semifireproof construction and their small size, and the facilities contained therein. It is necessary to bear in mind that the smaller the station structure, the higher the unit construction cost will be because of its wall ratio (relationship of perimeter to area), all other things being equal. The station that contains office space and lavatories only (two lavatories of two fixtures each), which would contain approximately 400 square feet, would cost as a minimum \$14 per square foot. This is the cost for an 8" concrete block building with no interior finish and but a waterproof paint applied to the exterior, having a built-up roof, a concrete floor and a small unit heater. This is typical of the inexpensive structures serving the cut-rate stations. The price includes painting, heating, interior electrical and plumbing costs. The average cost of a major company-owned station which contains office and lavatory space only would run between \$19 and \$20 per square foot, and its size would average between 475 and 500 square feet. This station is of concrete block and semifireproof construction, but in addition is of better grade construction than the minimum type of station. Greater amounts are spent for decorating, and these stations contain stone ornamental trim with plate glass extensively used. Costs may exceed \$22 or \$23 per square foot on extremely lavish office structures.

The two-bay service station, which is the most popular of modern stations, will vary in cost from \$10.50 per square foot to \$14 per square foot, depending on the quality of construction, the ornateness of design, as well as on the type of construction (concrete block, metal, brick, or stone). The average costs, however, run between \$12 and \$13 per square foot. These stations average in size from 1,300 to 1,500 square feet. Again, one must keep in mind the wall ratio, the square building being the most economical structure as it includes the greatest area with the minimum amount of wall space.

PAVING COSTS: Listed below are the costs of paving that would apply during nonfreezing weather only. The costs of laying concrete or black top would be considerably higher during periods of extremely cold weather.

6" reinforced concrete drive	65¢ per sq. ft.
5" reinforced concrete drive	55¢ per sq. ft.
Asphalt paving	25¢-30¢ per sq. ft.
4" concrete walks	40¢-50¢ per sq. ft.
6" concrete curbs	\$2 per linear foot
Crushed rock parking area	7¢ per sq. ft.

PUMP ISLANDS: Concrete pump islands vary somewhat in size, and the cost would vary proportionately. However, we are giving average costs of pump islands:

2-pump	\$ 130
3-pump	150
4-pump	200

PUMPS: The costs listed below do not include the costs of installation, freight or wiring. There is an average of \$5 setting charge for uncrating and placing the pump into position. The cost of installing the pumps, which includes bolting down, wiring and testing, will run approximately \$40 per pump. The noncomputing pumps will cost approximately \$330, the computing pumps will run approximately \$350, while the low-boy computing pumps will run \$375. Pumps with the hose reel attachments will run approximately \$400 in cost.

YARD WORK: This is an item that is very often omitted in computing the cost of a service station, despite the fact that yard improvement costs are quite sizable. The cost of installing the electrical work for a 3-pump station will average about \$450, for a 4-pump station \$475, for a 6-pump station \$700, and for an 8-pump station \$850.

The yard plumbing, which includes water, sewers, gasoline lines and air lines, will run about \$600 for a 3-pump station, \$675 for a 4-pump station, \$800 for a 6-pump station, and \$950 for an 8-pump station.

In the event that it is necessary to install a septic tank, an expenditure of approximately \$1,000 to \$1,500 is necessary, depending on the soil conditions.

TANKS: The cost of the tanks will vary but little from area to area, but the installation cost will vary greatly depending on the emplacement of these tanks, whether underground or above ground, vertical or horizontal, and on the soil conditions. In the event that any underground stone is encountered, the costs given would not apply. The underground installation costs include a sand backfill around the tank which will minimize the action of electrolysis, and in turn lengthen the life of the tank.

In some instances the tanks are anchored into position to prevent their floating to the surface when they are relatively empty and the ground becomes moist. The cost of anchoring the tanks in place will probably average about \$50 per tank. In some cases, however, particularly when the ground is sandy or rocky, such anchoring is unnecessary. Some firms merely have their tanks filled with water during the installation in order to anchor them during that period. Listed below are the tank costs and the average cost of installing these tanks below ground:

Tank (7-gauge)		Installation cost
Size	Cost	below ground
550	\$ 85	\$100
1,000	130	130
2,000	210	200
3,000	280	260
4,000	350	330
6,000	620	430

Actual installation costs vary considerably. These costs apply under average, ideal conditions and include excavation, setting of the tank, backfilling with sand

and dirt, installing a fill line with cap and a manhole with cover 1" above the ground level, and connecting the tank to the gasoline distributing lines.

Relatively few tanks are placed above ground today. The vertical emplacement is by far the cheapest. In this instance the ground is domed and covered with a rock fill upon which the tank is set. This is the least expensive method. To set them horizontally is slightly more expensive, as concrete supports are required to hold the tanks.

LIGHTING: The cost of electric advertising signs and yard lighting varies with the type and size of the signs. Standards for flood lights and pedestal signs will average about \$100 plus \$50 for installation. Mercury lamps and transformers will average about \$80. A 4-foot neon advertising sign will run in the neighborhood of \$100, while a plain one will run about \$25. There is a \$75 charge for installing the electric signs. A 6-foot pedestal sign will run \$160, while an 8-foot sign will run approximately \$225. Again, a \$75 installation charge should be added.

EQUIPMENT: Generally the equipment furnished in a service station consists of an air compressor, a hoist, high-pressure lubricating equipment and shelving, display equipment and a desk. A 1/3 h. p. air compressor will cost approximately \$145, a 1/2 h. p. \$160, a 3/4 h. p. \$180, a 1 1/2 h. p. \$300, and a 3 h. p. \$410. Installation charges will vary from \$25 to \$75, depending on the size of the equipment. Hoists will run from \$530 to \$565 for a full hydraulic 8,000-pound hoist. Installation will cost approximately \$125. High-pressure grease equipment will average \$800 plus a \$200 installation charge. Shelving, display equipment, and desk will average from about \$300 for a small station to \$500 and even higher for the larger ones.

COST OF REMOVAL: In many instances it is necessary for the appraiser to compute the cost of removing some of the improvements. The concrete islands would cost approximately \$50 each to remove, the hoist \$50, while the tanks will cost as much to remove as it costs to install them. Concrete paving can be removed for approximately 20¢ per square foot, while 6" concrete curbs will cost 30¢ per linear foot.

NOTE: These costs are based on experience in the St. Louis Metropolitan Area. Construction costs in the urban sections of some cities will run as much as 15% higher, while those in rural areas may average 15% less. For deviations from these base costs see page 2 of this manual.

ESTIMATING THE VALUE OF PORCHES

We have divided porches into four basic groups:

- I. The terrace - or porch without a roof.
- II. The open porch with roof.
- III. The screened porch.
- IV. The screened and storm sashed porch.

We have developed cost or value curves in three quality grades for each of these four classes of porches. These curves are shown on pages 99 and 100 and give the square foot cost or value for porches with up to 300 square feet of area. To use these curves you identify the class of porch being evaluated and decide on its quality grade. (In selecting the quality grade of the porch it is almost always correct to use the quality of the house as a guide. Average grade houses usually have average grade porches, and good grade houses usually have good grade porches.) Then read along the bottom line of the chart until you come to the figure corresponding to the area of the porch, then read directly up to the quality line you have selected and pick off the square foot cost figure from the left-hand scale.

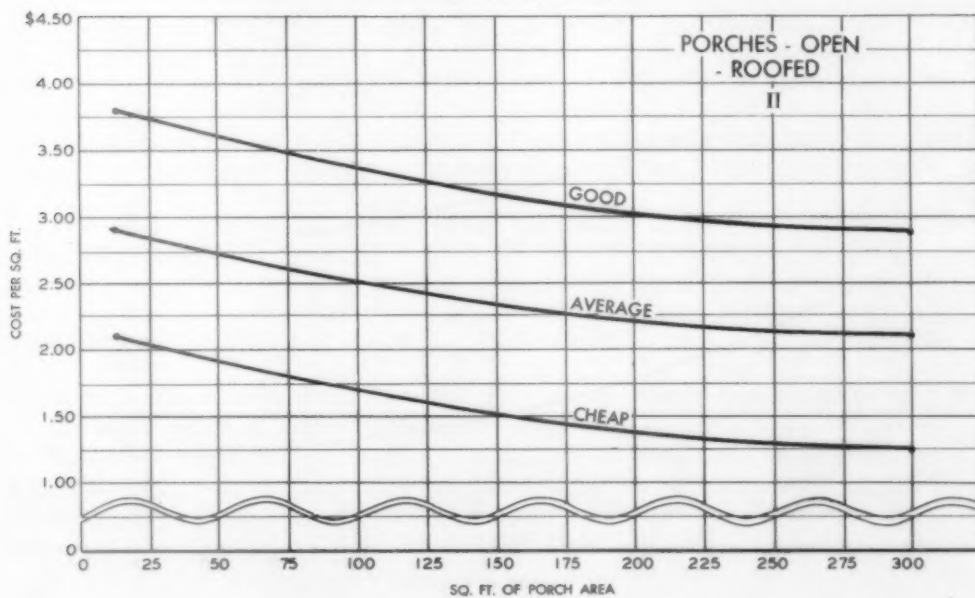
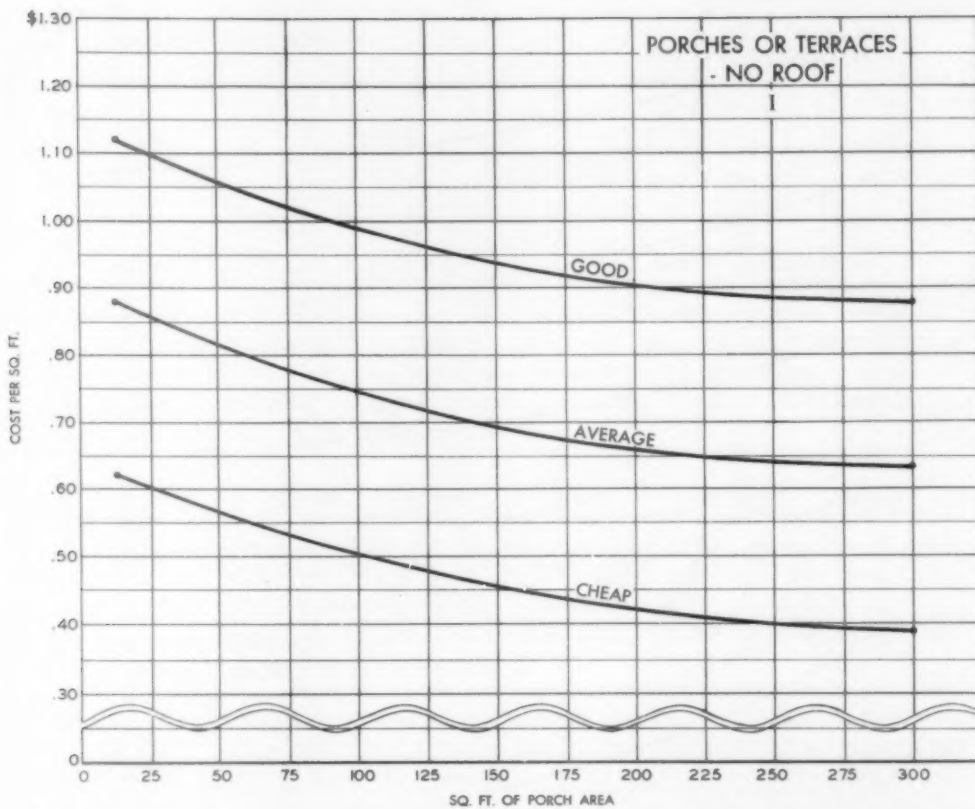
For example, a class II porch (open porch with roof, page 99) of average grade with 175 square feet of area will have a unit cost of \$2.25 per square foot and will be worth about \$395 before depreciation.

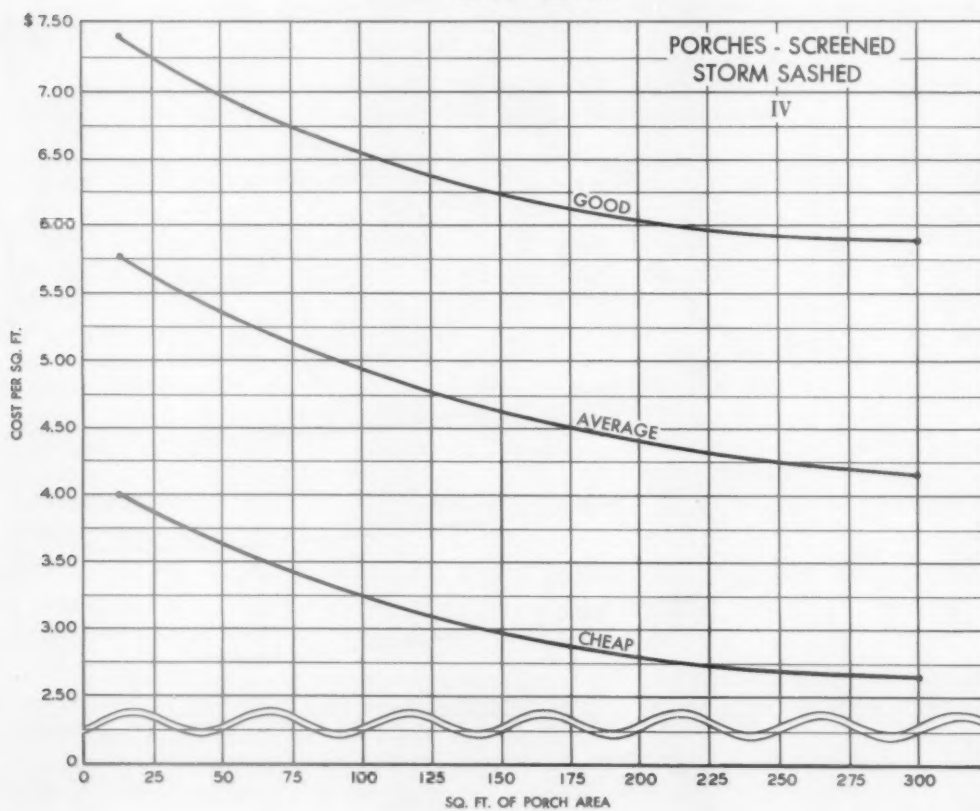
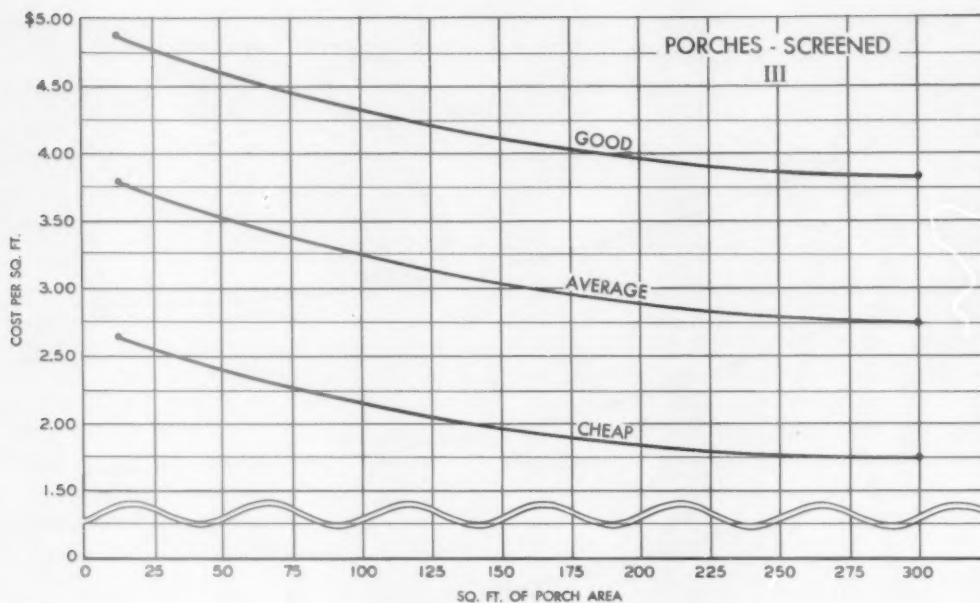
When there is a basement under the porch, add \$2 per square foot for the basement. If the porch has two stories, add 50% to its square foot cost.

We must point out that the unit values shown by these cost curves are intended to represent "market value" rather than reproduction cost. The lack of detail in the specifications of the four different classes indicates that we are not particularly concerned with reproduction cost. The reason we are not is that we feel that it is not nearly so important as the market value. In most instances it doesn't make a bit of difference in the sales price of a house if the porch slab is 4" thick or 6" thick, although the 6" slab will cost more than the 4". Along the same lines, we don't remember hearing of a buyer paying more for a house simply because its porch columns were round and fluted rather than square. In other words, there are many details that can go into porch construction that will run up the cost without resulting in a corresponding increase in the sales price of the house. For this reason we have not made any attempt to broaden our classification of porches nor to include all of the variations in specifications that increase the cost but which have little effect on the value.

Naturally, if a porch has some unusually outstanding features, the appraiser should add a little more to the values we show here. Most of the time, however, the cost curves will take care of evaluating the porches.

In the case of a completely enclosed porch care should be taken to determine whether or not the porch is actually another room. Our cost curves for a class IV porch do not include heating costs nor the cost of plastered walls and ceilings. Porches that are plastered and that have heat are usually counted as rooms, and their costs are figured at the same unit price as the rest of the house.





VALUATION OF RESIDENTIAL YARD IMPROVEMENTS

IN using the technique of the cost approach in the valuation of residential property, the appraiser may wish to include in his analysis estimated replacement costs for various yard improvements. Driveways, sidewalks, patios, fences, landscaping and similar items of construction can and do materially affect the total value of a residence.

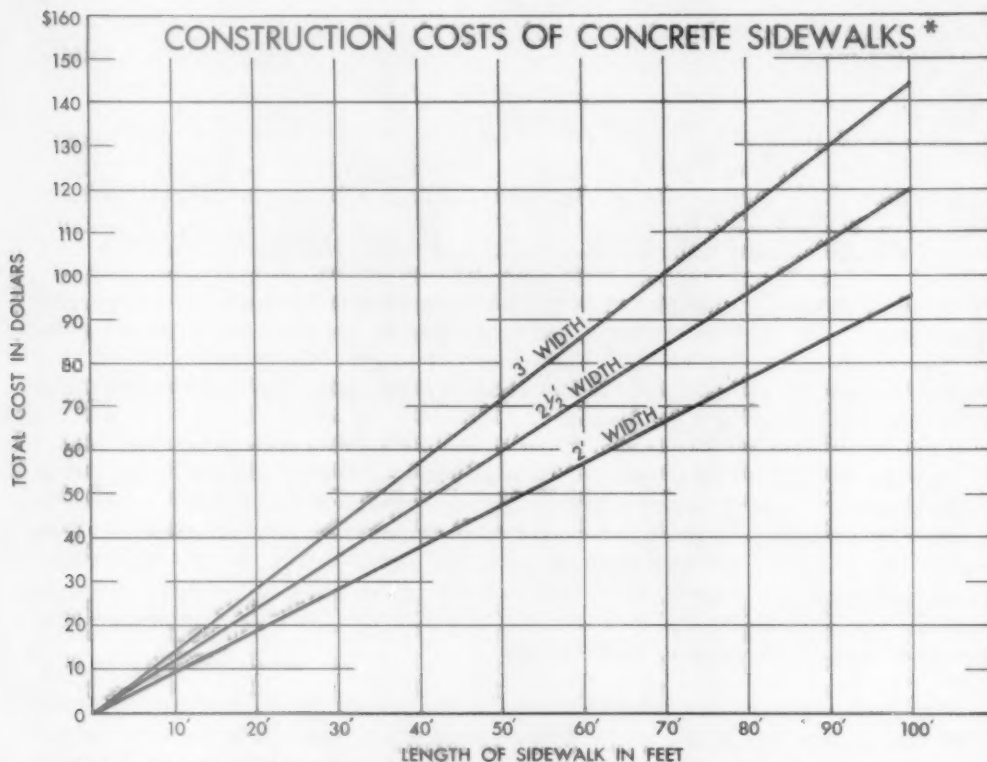
On the following two pages are graphs showing the estimated replacement costs of the two most frequently found yard improvements - sidewalks and driveways. The graphs are designed to aid the appraiser in his estimates of these costs. By pacing off the width and length of the improvement, he can then obtain an approximate total reproduction cost by reading the value on the left. Accompanying the graphs are listed a number of other familiar yard improvements and their estimated costs or cost ranges.

Because they are improvements to the land, there is an inclination among some appraisers to add the value of these yard improvements to the value of the land. It is our opinion, however, that in the cost approach these items should be added to other improvement costs (buildings) rather than become a part of land value. Consider, for example, the appraisals of two adjoining properties, one generously improved with a good sidewalk, driveway and landscaping, and the other with virtually no yard improvements. All other things being equal, the actual land value of these two properties would be the same. The difference in their total value would be reflected in the value of the improvements, in this instance, yard improvements, as an integral part of total improvement value.

Whenever construction is required on the land to bring it into usable condition, then those costs would be considered in the land valuation. If a drainage condition must be corrected, if large quantities of earth must be moved in (or out) to make a property usable for a residence, then the cost of such work when completed will be reflected in a higher land value.

With detailed construction costs for yard improvements the appraiser can, if he wishes, produce an impressive report containing a complete list of features to be included in the total reproduction cost figure. In doing this, he is performing a creditable service to his client, demonstrating that he has given attention to even these relatively small improvements to the property.

(cont. on page 104)



* INCLUDES AVERAGE GRADING, CINDER BASE, 4" CONCRETE WITH FINISHED SURFACE. - 48¢ PER SQ. FT.

APPROXIMATE COSTS OF YARD IMPROVEMENTS

Sidewalks and Patios

4" concrete on cinders with finished surface - 45¢-50¢ per sq. ft. (see graph above)

Common or used brick on sand base - 60¢-80¢ per sq. ft.

Common or used brick on concrete - \$1.20-\$1.60 per sq. ft.

Flagstone on sand base - \$1.00-\$2.00 per sq. ft.

Flagstone on concrete base - \$2.00-\$3.00 per sq. ft.

(There is a wide range in costs for flagstone improvements, depending upon the quality and weight of the stones.)

Fences

Frame (cedar), 4' - \$1.50-\$2.00 per lin. ft.

#9 Chain link, 4' - \$1.75-\$2.25 per lin. ft.

6' - \$2.50-\$3.00 per lin. ft.

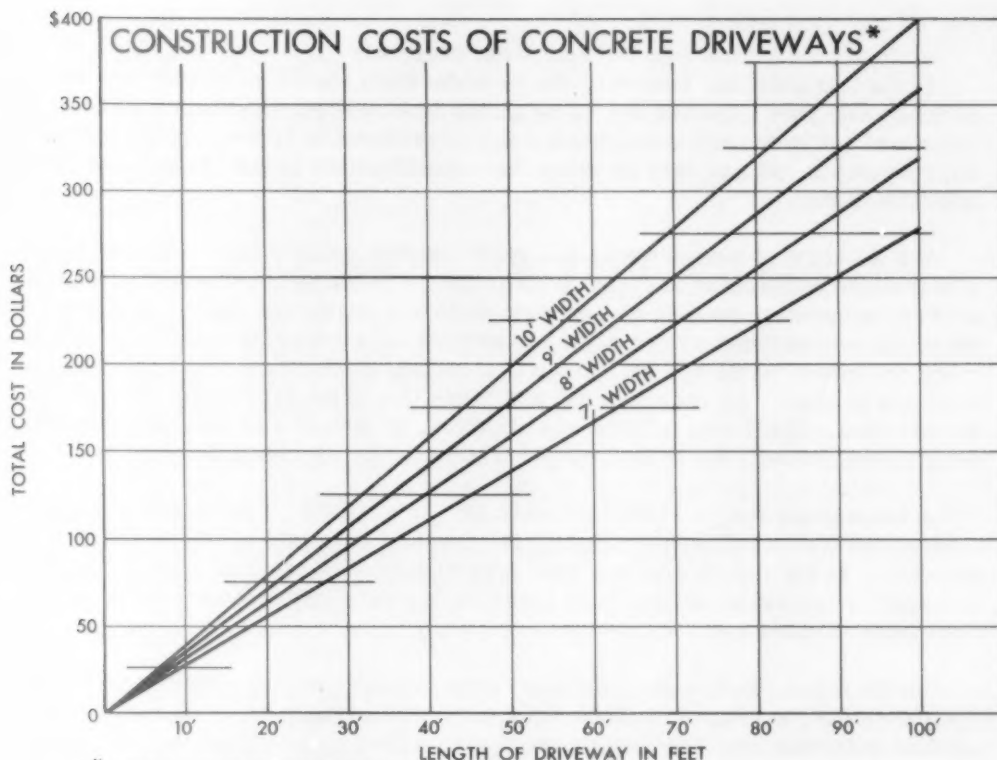
#6 Chain link, 4' - \$2.00-\$2.50 per lin. ft.

6' - \$3.00-\$3.50 per lin. ft.

Tight woven wire, 4' - 70¢-80¢ per lin. ft.

6' - \$1.00-\$1.25 per lin. ft.

(Costs for fences include an appropriate number of posts and gates.)



* INCLUDES AVERAGE GRADING, CINDER BASE, 5" CONCRETE - 40¢ PER SQ. FT.

Driveways

5" concrete on cinders - 38¢-42¢ per sq. ft. (see graph above)

Reinforced concrete - 42¢-46¢ per sq. ft.

Asphalt paving on 4" rock base - 22¢-28¢ per sq. ft.

Rock base with chat cover - 14¢-18¢ per sq. ft.

Walls or Retaining Walls

Brick - \$1.75-\$2.00 per sq. ft. of wall area

Stone - \$2.00-\$2.50 per sq. ft. of wall area

Concrete with stone veneer - \$3.50-\$4.00 per sq. ft. of wall area

Concrete block - \$1.40-\$1.60 per sq. ft. of wall area

Miscellaneous Landscaping Costs

Sodding - 30¢-50¢ per sq. yd.

Raking, seeding, fertilizing - 7¢-10¢ per sq. yd.

New shrubs - average \$2.50 each for medium size

Small trees - \$8.00-\$12.00 per tree

Note: All costs shown are assumed to include materials, labor and average workmanship. Many of the improvements listed here are constructed by "amateur builders" - the home owners. For this reason, if the quality of the improvement is below average, costs should be adjusted accordingly.

(cont. from page 101)

From this point on, however, due consideration should be given to the value added by this yard improvement. Just as the factors of physical depreciation and functional and economic obsolescence are considered in appraising the building improvements, so can they be taken into consideration in the valuation of yard improvements.

We all know of homes which are more readily salable than others because of attractive landscaping and yard arrangement. Undoubtedly, the market values of these properties include an aesthetic and/or a utilitarian value considerably above the actual construction costs of the yard improvements which make them more desirable. This will be true up to a certain point where overimprovement becomes evident. An architect can add value to a home far beyond the costs of his services. Similarly, a landscape architect, by proper site planning, can add value to the property far beyond the costs incurred by his recommendations.

A formal garden, a fancy barbecue pit, or a winding sidewalk in some instances will add a value to a property in excess of the costs of their actual construction. In his report, the appraiser may wish to point out these considerations and apply a functional or aesthetic factor to his yard improvement costs or his total improvement costs.

On the other hand, some land improvements may actually detract from the desirability of the property. Poor arrangement of garage and house may necessitate a driveway which cuts up the yard area with a large turning apron. Steep grades of driveways with high retaining walls could detract rather than add to value. Shrubbery may be haphazardly arranged; a poorly planned but costly storage corner in the yard may be unsightly; improper grading may smother attractive trees or pitch surface water towards the foundation. Any of these or similar yard "improvements" may lower the value of a property, and the appraiser may have to depreciate his construction costs 100%, or even further penalize against the total value because of aesthetic or functional considerations.

Also, any yard improvements which are personal property rather than part of the real property should not be included in the appraisal. Generally, personal properties are movable items, not affixed permanently to the real estate. The owner's intention of later removing a yard improvement should be considered. For instance, birdbaths, sundials, swings, benches and similar items cannot be included as real property, in most cases, in spite of the fact that they may add to the marketability of residences.

Generally speaking, when including yard improvements in the valuation of residential property, the appraiser has several principal factors he should consider; not only replacement costs, but also aesthetic considerations, physical deterioration, and functional or utilitarian considerations.

ESTIMATING REPLACEMENT COST OF GARAGES

THE four charts on pages 106 through 109 may be used to estimate accurately the cost of frame garages, concrete block garages, brick veneer garages and brick garages. The curves are applicable to virtually all sizes of garages usually found on residential property.

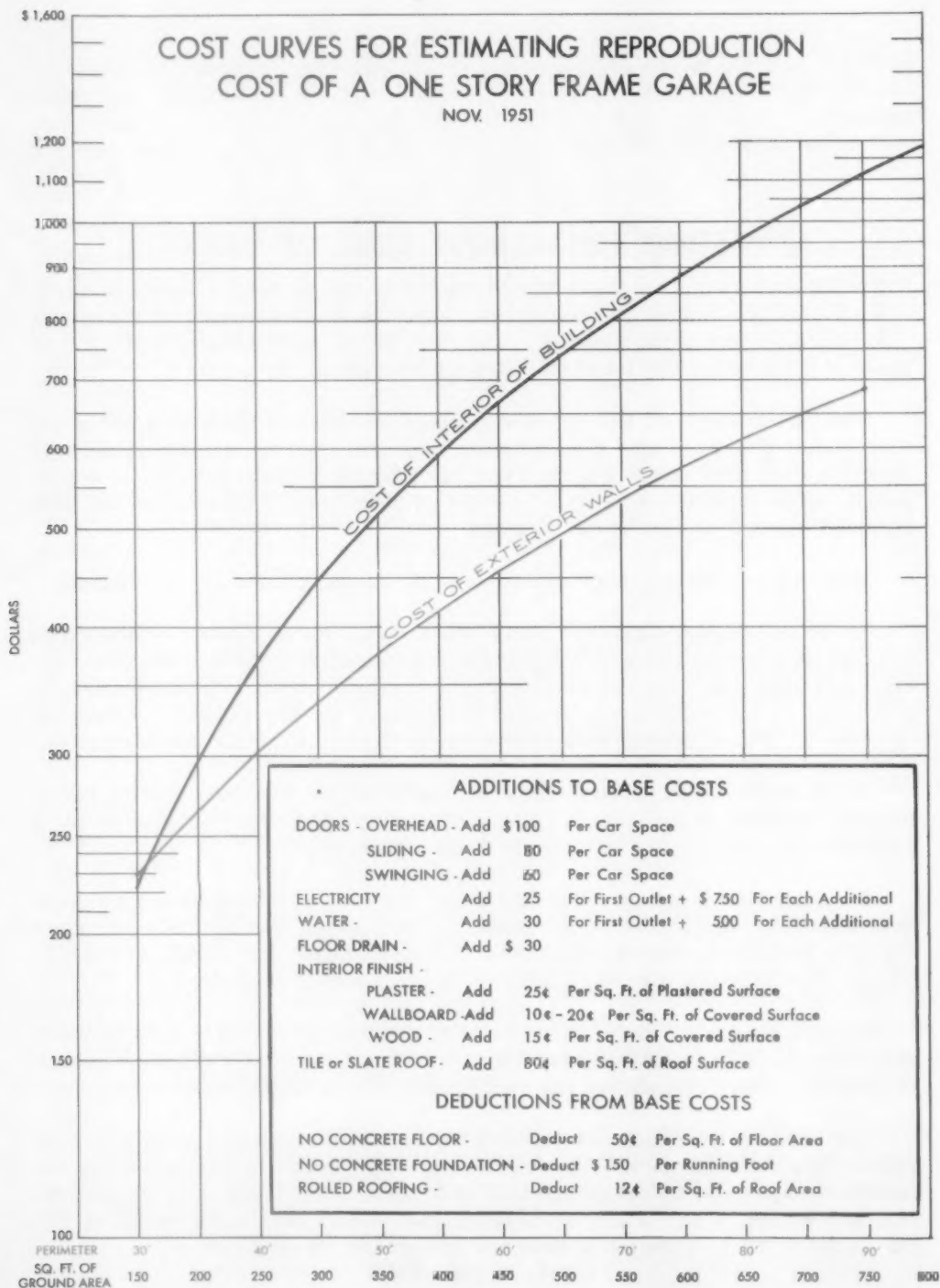
The base costs of all four types of garages assume average workmanship and materials. The base cost also includes a poured concrete foundation and a 4" concrete floor over cinder bed for each type of garage. Each garage has a 210-pound asphalt shingle roof over 1" wood roof sheathing. Two windows are also included in the base cost of each garage.

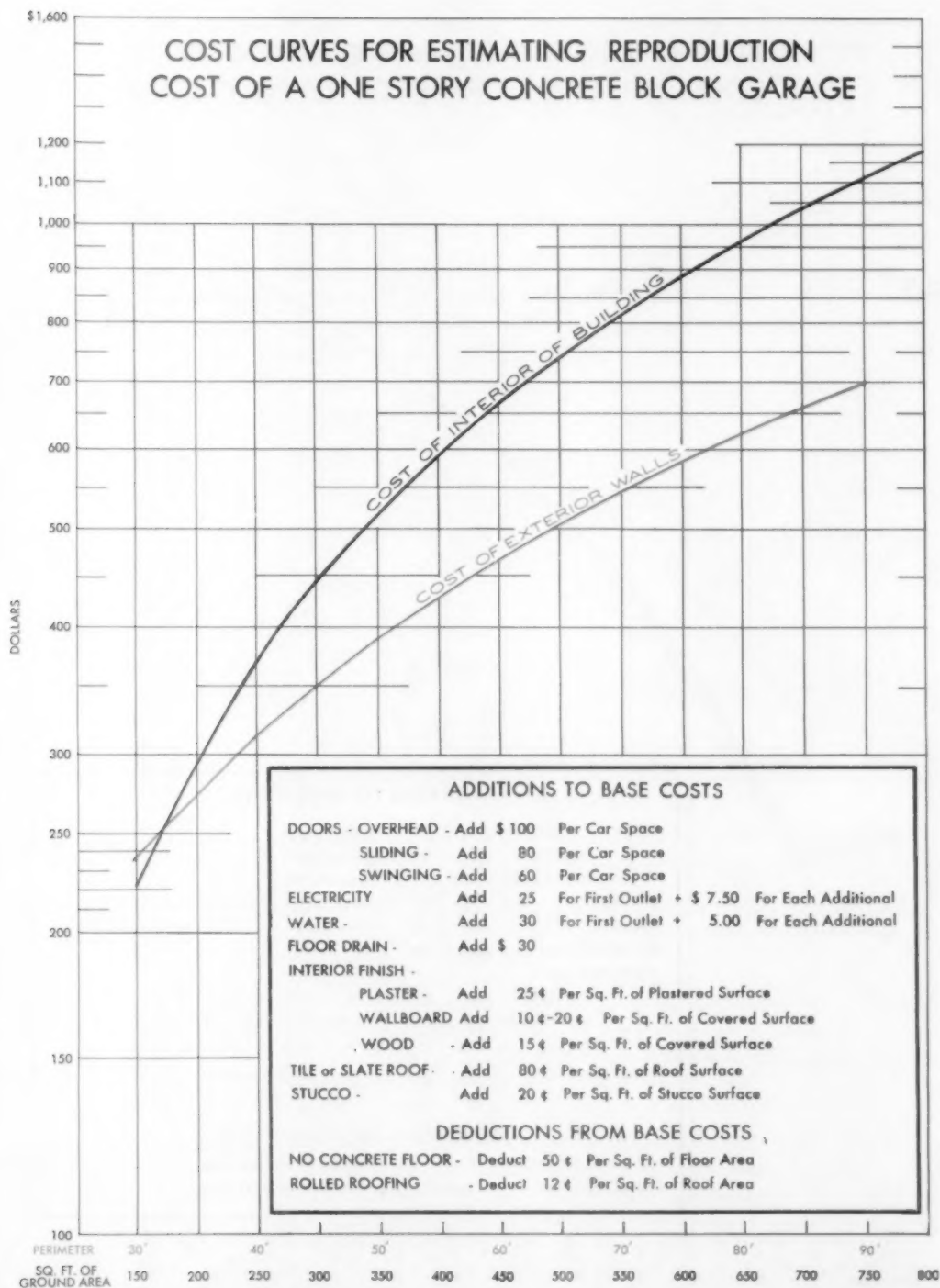
Other specifications which are covered by the base costs are as follows:

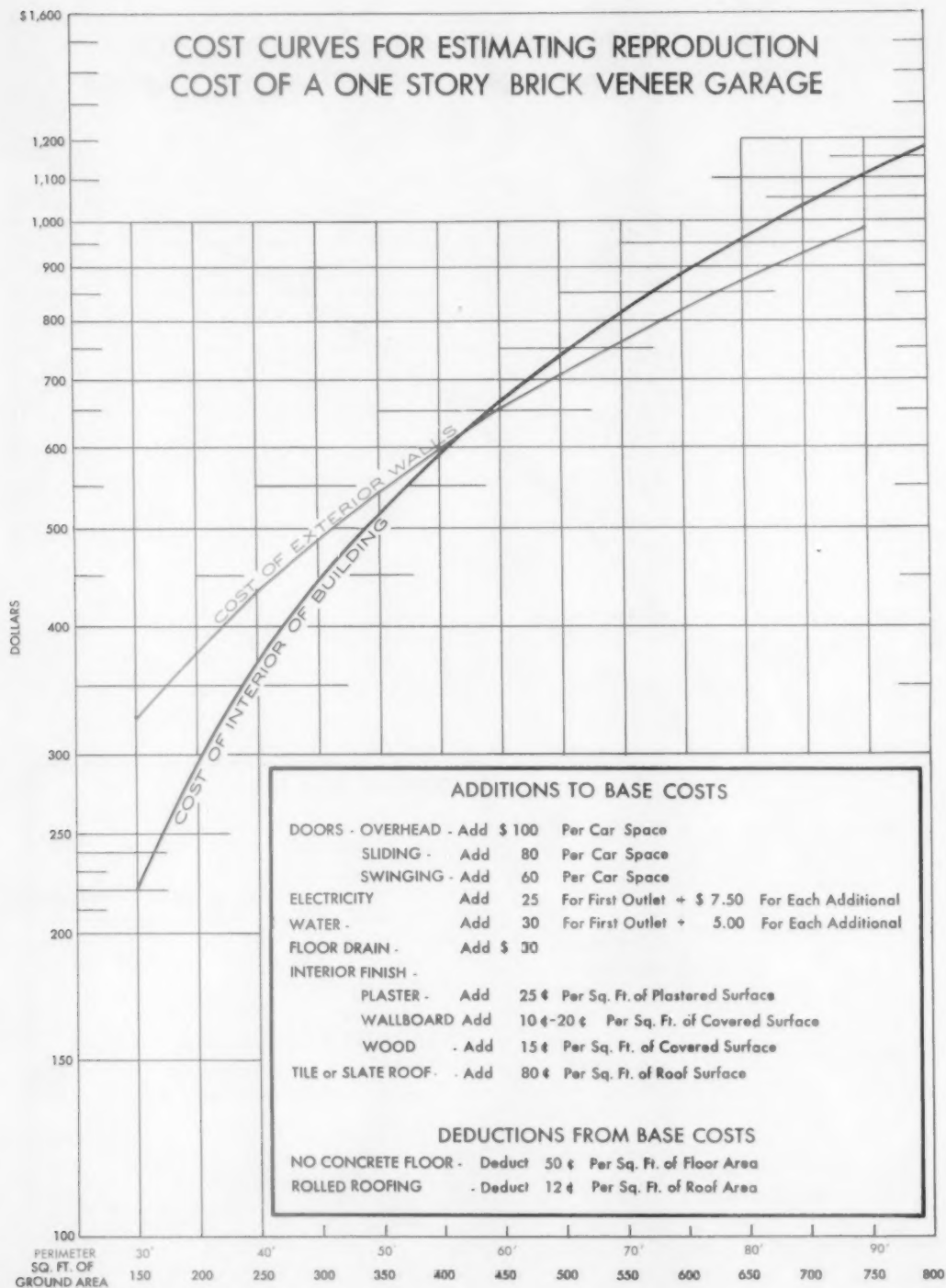
1. Frame garage - Exterior walls, 2 x 4 studs, 16" on center, covered with average-grade drop siding and painted with three coats. No wall sheathing included in base cost. Cost of doors and other variable items, such as electricity and water connections, is covered by the table in the lower right-hand corner of chart 1. Floor, foundation and roof specifications have already been given.
2. Concrete block garage - Exterior walls of 8" x 8" x 16" concrete block, painted two coats on the outside. The cost of stucco and other variable items is covered in the table in the lower right corner of chart 2.
3. Brick veneer garage - Exterior walls, one course of common brick veneer over sheathing, supported by 2 x 4 studs, 16" on center. Cost of doors and other variable items is covered by the table in the lower right-hand corner of chart 3. Floor, foundation and roof specifications have already been given.
4. Brick garage - Exterior walls of 8" common brick. The cost of doors and other variable items is covered by the table in the lower right-hand corner of chart 4. Floor, foundation and roof specifications have already been given.

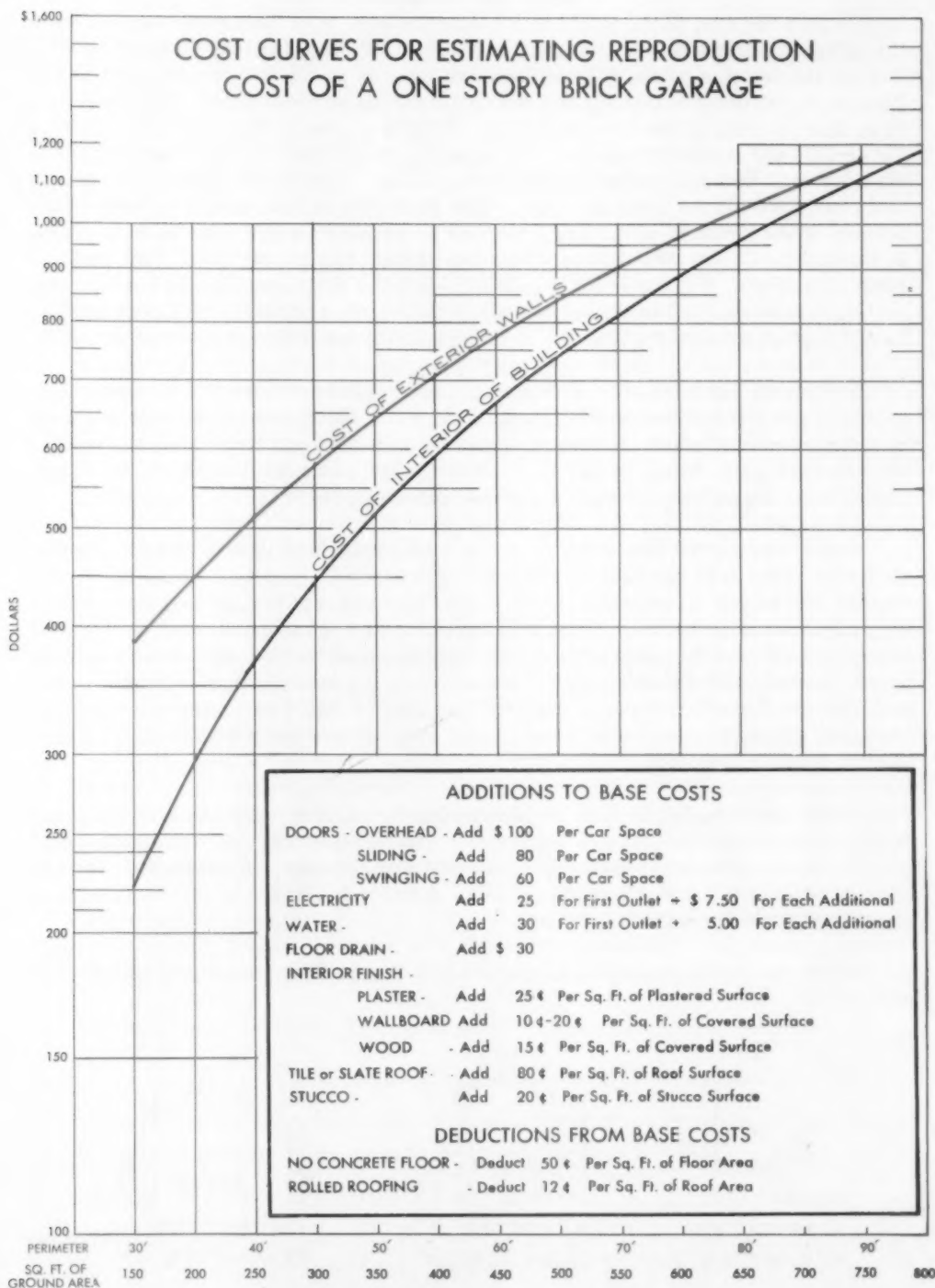
The red curve on each chart shows the cost of the exterior walls or of the vertical portion of the garage. In determining the perimeter of the garage, do not include the end in which the garage door is located, since there is no wall there. In other words, a 10' x 20' detached garage would have a perimeter of 50' (20' + 20' + 10'). (The gable ends are included in the roof cost.)

(cont. on page 110)









(cont. from page 105)

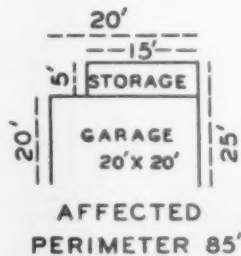
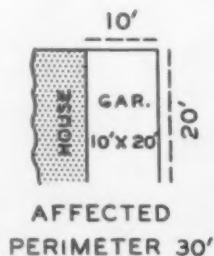
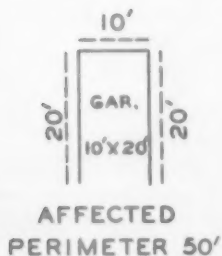
To find the cost of the walls in a frame garage, it is first necessary to know the affected perimeter. In the case of a 10' x 20' garage, this distance is 50'. Follow the red line on chart 1 until you are directly above 50' on the lower scale. Then move directly to the left and read \$380 off the vertical scale. The next step is to find the cost of the floor and roof. This is shown by the blue line. Since a 10' x 20' garage is 200 square feet in area, you follow the blue line until it is directly over 200 square feet on the lower scale. Then move directly to the left and read \$296 off the vertical scale. The next step is to consult the table at the bottom of the chart to make any additions or deductions that may be necessary. In this instance, we will assume that the garage has an overhead door and one electric outlet. We, therefore, add \$100 for the door and \$25 for the electric outlet. By adding all of these factors together we arrive at the figure of \$801 as the replacement cost of the 10' x 20' frame garage (\$380 + \$296 + \$100 + \$25).

In figuring the cost of an attached garage, only two sides are totaled in arriving at the affected perimeter. Thus, if the 10' x 20' frame garage was attached to a house, the affected perimeter would be only 30'. In this case, the cost of the exterior walls would be \$228, while the other costs would remain the same. Therefore, the attached frame garage would cost \$654.

While we believe that the cost curves on these four charts are reasonably accurate, they will not take care of all variations in quality. Remember, the curves are based on average-grade materials and workmanship. The cost of cheap construction will run about 10% less and the cost of good construction will run about 10% more. Moreover, good-grade construction will usually include more "additional" factors, such as water connections, drains, electric lights and interior finish. This condition will usually be found in three- and four-car garages, because anyone with three or four automobiles will usually build a high-quality house and garage.

These cost curves can also be used to figure the cost of tool houses, storage sheds and work shops that are frequently attached to garages. The extra walls should be considered as part of the affected perimeter. If these walls do not have footings and foundations under them, a deduction of \$1.50 per running foot should be made from the total cost.

Below are three examples of the proper way to find the amount of affected perimeter.



SUMMER COTTAGES

As a result of rising incomes and more leisure time, there has been a big increase in the number of summer cottages since 1946. Nearly all of us know of various artificial lakes that have been built for the purpose of selling lakefront lots to families who want to build their own lakeshore cabin or cottage. There has also been a big increase in this type of activity in the older resort areas all over the country.

In the past few years we have appraised several hundred resort cottages in various parts of the country and have developed a set of cost figures that we have found fairly reliable.

You realize that there are literally thousands of variations in the construction of summer cottages and that some rather bizarre effects are sometimes achieved. It is not practical to draw up a set of costs and specifications that would cover all of these variations. The following specifications are, therefore, rather general and may be varied somewhat without any appreciable change in the final value.

Insofar as the cost curves are concerned, we believe that most of you are familiar with their use. After finding the ground area of the building you simply follow the appropriate curve over to the cost per square foot scale on the left of the chart and take the square foot cost from this scale.

These cost curves are based on the cost of simple, inexpensive buildings. Except in mild climates they are not suitable for year-round occupancy, and all or a major portion of the construction work is frequently done by the owner.

The base specifications are shown below.

TYPE I - Low-Cost Summer Cottages

FOUNDATION:	Masonry or wood piers, or cheap masonry foundation.
BASEMENT:	No basement.
EXTERIOR WALLS:	Novelty siding; asphalt or composition shingles.
ROOFING:	Light-weight asphalt shingles; roll roofing; metal roofing.

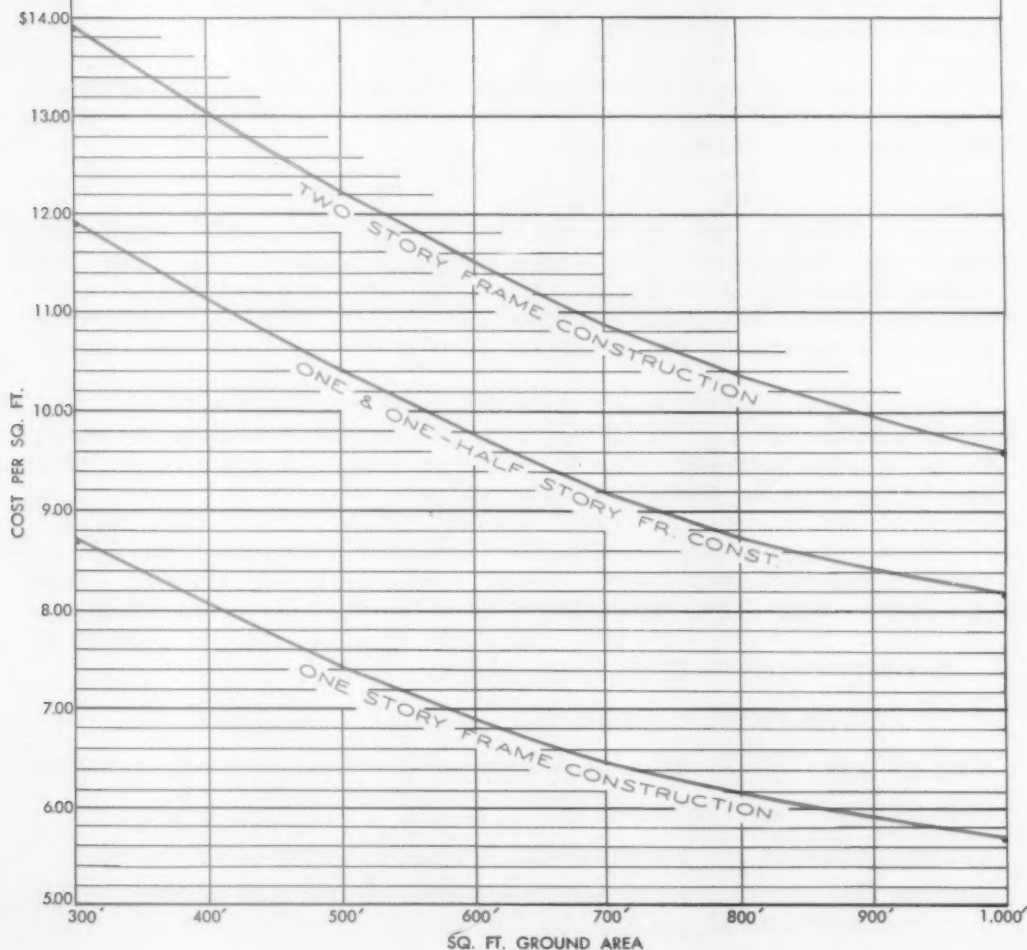
LOW-COST SUMMER COTTAGES

ADDITIONS TO COSTS SHOWN BELOW

1. Basements - Add \$1.20 per sq. ft. for concrete basement.
Add \$0.90 per sq. ft. for dirt basement.
2. Fireplaces - Add \$250 to \$400 each.
3. Plumbing - Add \$100 for each extra fixture (more than 4).
4. Porches - Open: Add 45¢ to 55¢ per sq. ft. of porch area.
Open and roofed: Add \$1.25 to \$1.75 per sq. ft. of porch area.
Screened: Add \$1.75 to \$2.50 per sq. ft. of porch area.
Glassed: Add \$2.75 to \$3.50 per sq. ft. of porch area.

DEDUCTIONS

1. Plumbing - Deduct \$700 for no plumbing.
Deduct \$600 for no bath.



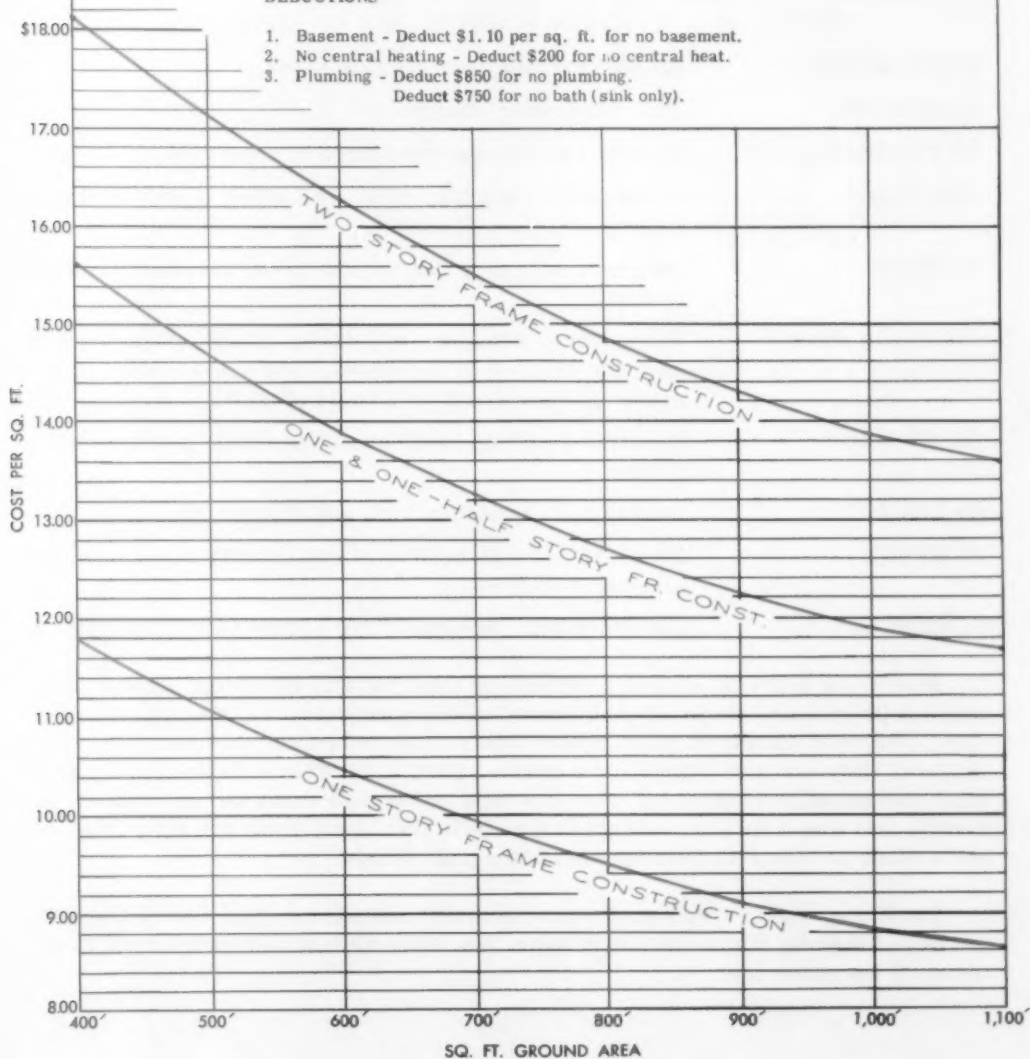
AVERAGE - COST SUMMER COTTAGES

ADDITIONS TO COSTS SHOWN BELOW

1. Basements - Add 30¢ per sq. ft. for concrete floor.
2. Fireplaces - Add \$300 to \$450 each.
3. Plumbing - Add \$115 for each extra fixture (more than 4).
4. Porches - Open: Add 65¢ to 80¢ per sq. ft. of porch area.
Open and roofed: Add \$2 to \$2.75 per sq. ft. of porch area.
Screened: Add \$2.75 to \$3.50 per sq. ft. of porch area.
Glassed: Add \$4 to \$4.50 per sq. ft. of porch area.

DEDUCTIONS

1. Basement - Deduct \$1.10 per sq. ft. for no basement.
2. No central heating - Deduct \$200 for no central heat.
3. Plumbing - Deduct \$850 for no plumbing.
Deduct \$750 for no bath (sink only).



FLOORS:	Single flooring on 2 x 6 wood joists.
INTERIOR FINISH:	Stock doors and windows; minimum trim; cheap wall-board or plaster.
LIGHTING:	Electric lighting and cheap fixtures; drop cord switches; minimum wall outlets.
PLUMBING:	Cheap 3-fixture bath and kitchen sink.
HEATING:	Stove or unit heater.
PORCHES:	Not included. See chart for additions to base cost.

TYPE II - Average-Cost Summer Cottages

FOUNDATION:	Rubble masonry or concrete block.
BASEMENT:	Full basement; dirt floor.
EXTERIOR WALLS:	Novelty siding; asbestos shingles; low-grade clapboard.
ROOFING:	Composition shingles; chimney flashed; galvanized iron gutters.
FLOORS:	Subfloors with good pine or low-grade hardwood finished flooring.
INTERIOR FINISH:	Stock doors; windows; millwork; kitchen storage space and shelving; 2 or 3 closets; walls and ceiling good-grade plasterboard or 2 coats plaster.
LIGHTING:	Electric lighting; wall switches; wall plugs in each room.
PLUMBING:	Fair-grade 3-fixture bath and kitchen sink.
HEATING:	Pipeless furnace or low-grade gravity furnace where climate requires.
PORCHES:	Not included. See chart for additions to base cost.

Insofar as depreciation is concerned, we think you will agree that summer cottages depreciate much faster than conventional, year-round residences. For one thing, they are usually of much lighter construction and poorer workmanship. For another, they are unoccupied for a greater part of the year. In the third place, their maintenance is often not what it should be because many owners (quite correctly) feel that a summer cottage is a place to fish, loaf, relax and enjoy life and not a place to spend the summer wielding a paint brush.

For these reasons we usually give summer cottages a total life of about 20 years and thereby depreciate them more than twice as fast as a year-round residence of the same age.

**MISCELLANEOUS BASIC APPRAISAL
INFORMATION**

RESIDENTIAL CONSTRUCTION COST DATA

The problem of estimating construction costs by the cubic foot method is often complicated by different building designs. For example, a residence without a basement will have a higher cubic cost than another of the same area with a basement. Likewise, the newer types of houses with their low gables will have a higher cubic cost than will an older type of house (of the same quality) with high gables.

For the past several years we have published breakdowns of cubic foot costs by type of space. In these breakdowns we show the cost per cubic foot of roof space, living space, and basement space. The cubic content of the roof is figured from the top of the ceiling joists to the outer surface of the roof. The cubic content of the basement is figured from the bottom of the first floor joists to 6" beneath the basement floor. The living space includes all volume lying between the bottom of the first floor joists and the top of the ceiling joists.

In computing the costs of the basement and attic space, only the structural portion has been considered. The cost of the plumbing, heating, and electrical systems is included in the cost of the living space, even though portions are actually located in the basement or attic.

The various unit cost figures may be substituted within certain limits. For example, suppose you were appraising a brick house of approximately the same size and shape as the six-room frame house. Instead of using 91.6¢ per cubic foot for the cost of the living space, you would substitute the cost of the living space in the six-room brick house, or \$1.005 per cubic foot. You would find, then, that the living space would cost \$14,850 and the total cost would be \$17,870, compared with \$16,570 for a frame house of the same size and shape.

In a slightly different manner, suppose you were appraising a brick veneer house of approximately the same size and shape as the brick ranch house. This is a small house of only 16,250 cubic feet, including a full basement. Moreover, it has a very small roof cubage. These two factors account for the high cubic foot cost of its living space (\$1.21). Because of the wide difference in size, it would not be correct to substitute the cost of the living space in the brick veneer house (95.8¢). However, it would be correct to adjust this \$1.21 per cubic foot downward in proportion to the difference in the cost of living space in the five-room brick and the five-room brick veneer. Since the living space in the five-room brick costs 99.5¢ per cubic foot, and that in the five-room brick veneer costs 95.8¢, it is permissible to reduce the \$1.21 by about 4%. Therefore, the living space in a brick veneer ranch house would cost about \$1.16 per cubic foot, compared with the \$1.21 in the brick ranch house.

The total cost of the basement space is naturally governed by the size of the ground area. The exception to this is found in the basement cost of the brick ranch house. Its cost of \$1,580 is the lowest of any of these houses with basements. However, it is of new design and has a lower basement ceiling than the older types of houses and no outside basement entrance. Furthermore, its foundation walls are 8" thick compared with 12" in the other houses. The California-type bungalow should not be included in this comparison because it has no true basement. There is only a crawl space. The foundation is poured concrete, 6" thick, and the cost of the "basement" is made up of the foundation walls, footings, and 4 x 4 wood supports.

CUBIC COSTS OF DIFFERENT TYPES OF SPACE



SIX-ROOM FRAME HOUSE

(Ground area 825 sq. ft.)

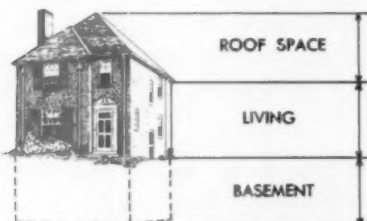
Type space	Cost	Volume	Cost per cu. ft.	% of total cost
Roof	\$ 1,050	3,300	31.8¢	6.3
Living	13,550	14,788	91.6	81.8
Basement	1,970	6,200	31.8	11.9
Total	\$16,570	24,288	68.2¢	100.0



FIVE-ROOM BRICK VENEER HOUSE

(Ground area 1,165 sq. ft.)

Type space	Cost	Volume	Cost per cu. ft.	% of total cost
Roof	\$ 1,825	5,003	36.5¢	12.1
Living	10,655	11,125	95.8	70.5
Basement	2,620	8,782	29.8	17.4
Total	\$15,100	24,910	60.6¢	100.0



SIX-ROOM BRICK HOUSE

(Ground area 751 sq. ft.)

Type space	Cost	Volume	Cost per cu. ft.	% of total cost
Roof	\$ 1,100	2,878	38.2¢	6.4
Living	14,300	14,222	100.5	82.6
Basement	1,900	6,000	31.7	11.0
Total	\$17,300	23,100	74.9¢	100.0



SIX-ROOM CALIFORNIA BUNGALOW

(Ground area 992 sq. ft.)

Type space	Cost	Volume	Cost per cu. ft.	% of total cost
Roof	\$ 850	2,480	34.3¢	9.0
Living	8,100	8,430	96.0	86.0
"Basement"	470	1,209	38.9	5.0
Total	\$ 9,420	12,119	77.7¢	100.0



BRICK BUNGALOW

(Ground area 1,190 sq. ft.)

Type space	Cost	Volume	Cost per cu. ft.	% of total cost
Roof	\$ 1,860	5,223	35.6¢	12.0
Living	11,000	11,050	99.5	71.0
Basement	2,630	9,100	28.9	17.0
Total	\$15,490	25,373	61.0¢	100.0



BRICK RANCH HOUSE

(Ground area 840 sq. ft.)

Type space	Cost	Volume	Cost per cu. ft.	% of total cost
Roof	\$ 840	2,520	33.3¢	7.5
Living	8,810	7,300	120.7	78.5
Basement	1,580	6,430	24.6	14.0
Total	\$11,230	16,250	69.1¢	100.0

MULTIPLE USE DEPTH CHART AND TABLE

THE development of appraisal techniques and procedures has been greatly facilitated by the use of certain guides and bench marks. Among these are unit cost data, depreciation tables, capitalization rates and depth tables. Without these very useful markers the sound and seasoned judgment of appraisers would find it difficult to steer a true course.

The development of depth tables has been most interesting, probably beginning with the old 4-3-2-1 method over 100 years ago. Since that time various appraisers and valuation experts have evolved many other methods. The use of depth tables has been scorned by many appraisers on the basis that they represented opinion only and were not subject to measurement by known data. While it is true that depth tables cannot be scientifically substantiated, we think that that is a poor reason for ignoring them altogether. After all, no one has ever devised a scientific method for measuring depreciation - yet it takes place, and some depreciation table or curve must be used by all appraisers.

In preparing the following depth chart and depth table we have used what we believe to be a new approach. We have based our estimates on standard lots of different depths. In most neighborhoods there is a "standard" depth of the lots. In some, this "standard" depth is 100 feet, in others 150 feet, and in neighborhoods with large deep lots, the "standard" depth may be 200 feet or deeper. It seems obvious that "standard" lots of 150 to 200 feet deep should not be evaluated by a depth table with a standard depth of 100 feet. If most lots in a neighborhood are 200 feet deep, and one happens to measure 250 feet, this deeper lot should be appreciated on the margin whereby it exceeds the depth of the neighborhood "standard" (200 feet) rather than by its margin over the 100-foot lot. In other words, the added value is by virtue of the extra 50 feet and not on an "extra" 150 feet.

As another example, suppose an appraisal was being made on a lot 110 feet deep. This lot is located in a neighborhood of predominantly 150-foot lots. The value per front foot on the 150-foot lots is known. The value of a 100-foot lot in a similar neighborhood is also known. Instead of taking the value of the 100-foot lot in the other neighborhood and adding to it for the additional 10 feet to find the value of the 110-foot lot, this value should be found by subtracting from the value of the 150-foot lot.

In order to use the depth chart, first determine the standard depth lot for the neighborhood and the improvement. Then locate the depth of the lot under appraisal on the lower scale of the chart. Follow a vertical line up from this point until it intersects the curved line representing the standard depth already determined.

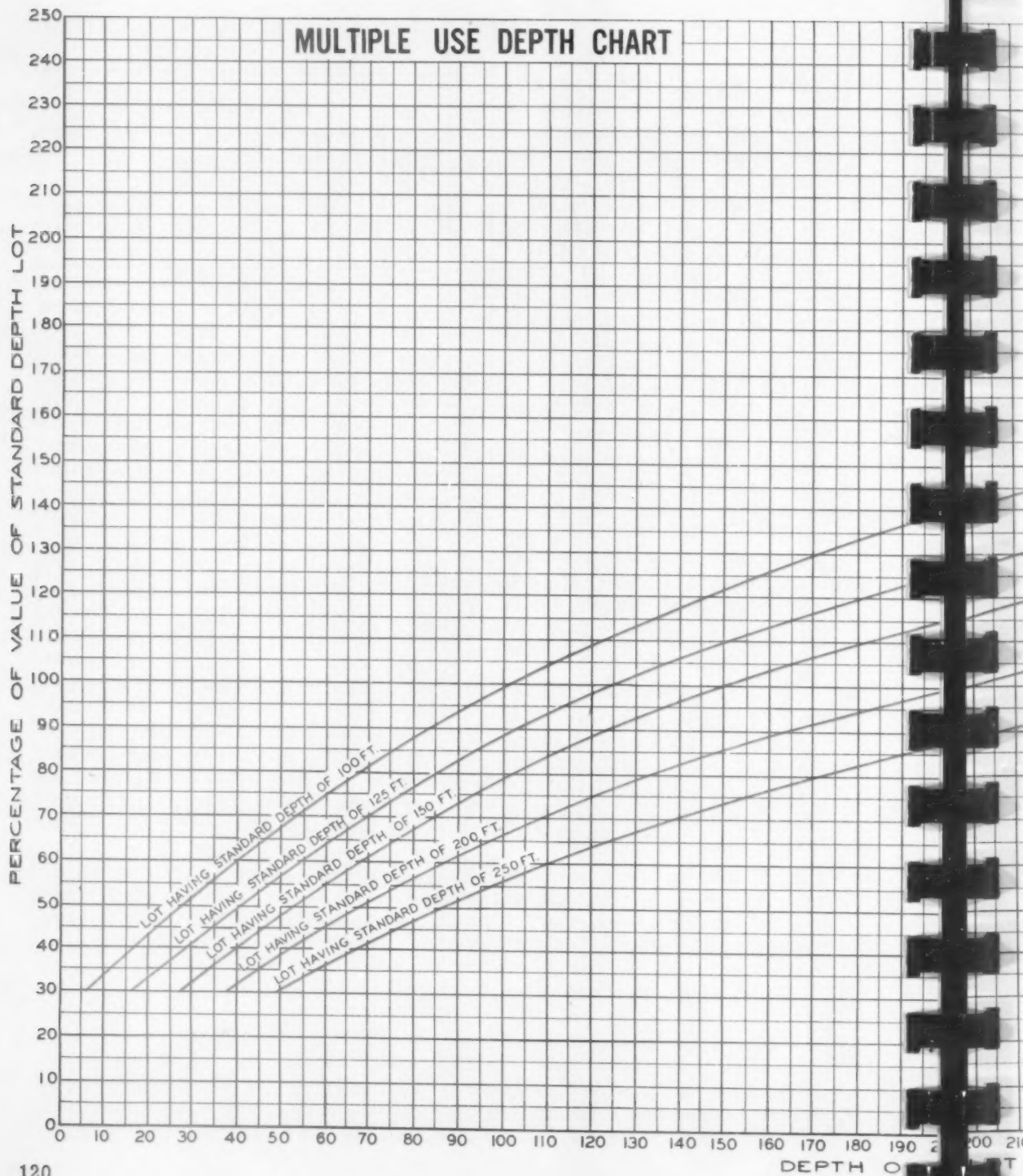
DEPTH TABLE

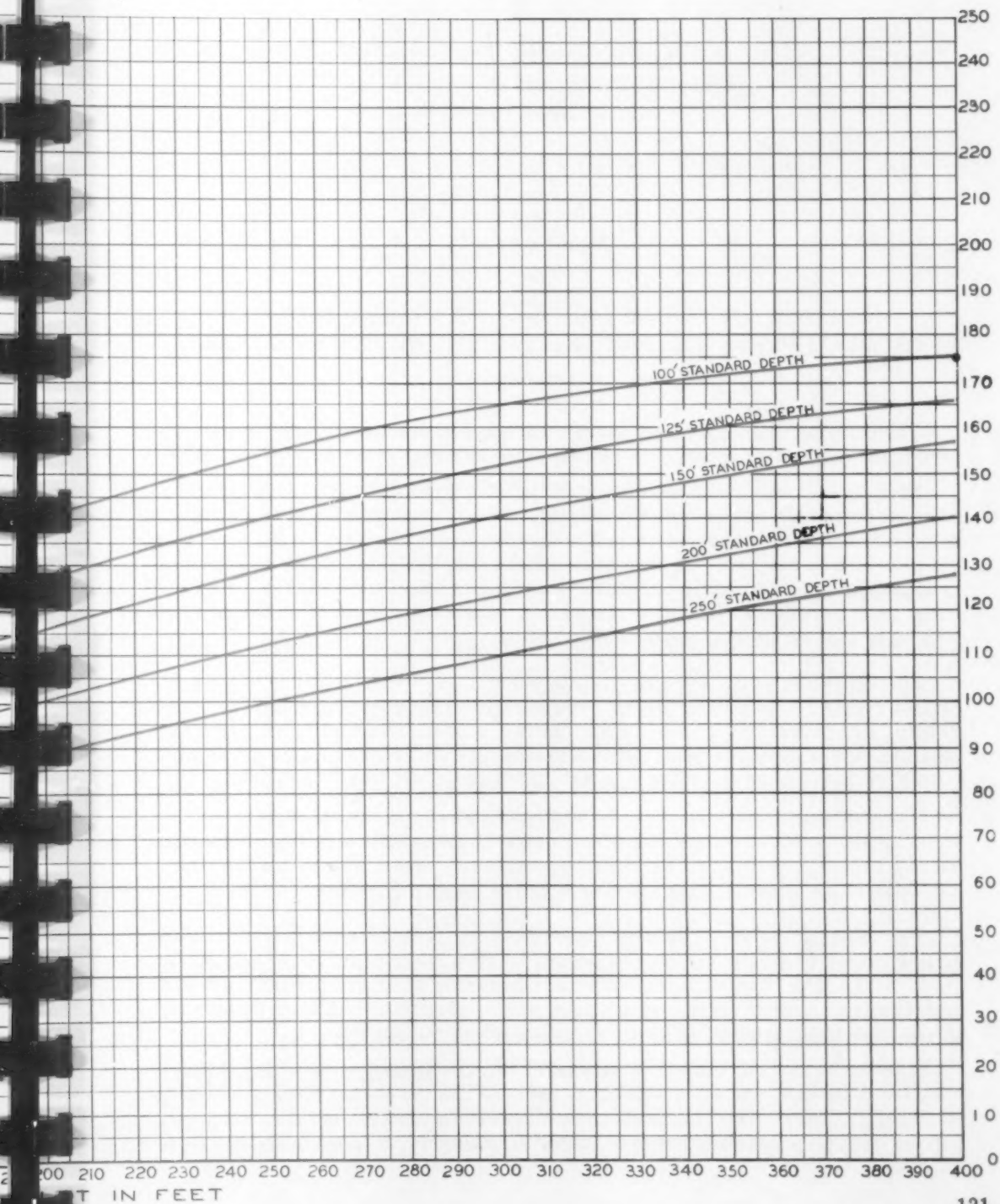
From the point where these two lines intersect, move horizontally to the percentage scale on the left of the chart. The reading on this scale will give you the percent of standard lot value to apply to the lot being appraised. To illustrate: Assume that the standard lots in the neighborhood are 150 feet deep and sell for \$40 a front foot. The lot to be appraised is 100 feet deep. From the lower scale project a vertical line until it meets the 150-foot "standard depth" line. From this point move horizontally to the percentage scale on the left. This scale shows that the adjustment should be 79%. By applying this percentage to the \$40 per front foot (price of the 150-foot lots) the value of the shorter lot is found. ($79\% \times \$40 = \32 per front foot for this 100-foot deep lot.)

The table at the right was compiled by taking selected depths from the chart and showing the percentage adjustment that applies to them when various depth lots are used as "standard."

	Depth of lot to be appraised	Standard Depth				
		100 ft.	125 ft.	150 ft.	200 ft.	250 ft.
(Percentages taken from depth chart on following pages.)	10'	34%	-	-	-	-
	20'	44	34%	-	-	-
	30'	52	41	33%	-	-
	40'	61	50	41	32%	-
	50'	68	57	48	39	31%
	60'	75	65	56	46	37
	70'	82	71	62	52	42
	80'	88	77	68	57	47
	90'	94	83	74	62	52
	100'	100	89	79	67	57
	110'	105	94	84	71	60
	120'	109	98	89	75	64
	130'	113	103	93	79	68
	140'	118	106	97	83	71
	150'	122	110	100	86	74
	160'	126	114	104	89	77
	170'	130	117	107	92	80
	180'	134	120	110	94	83
	190'	137	123	113	97	85
	200'	140	126	116	100	88
	225'	147	134	123	107	94
	250'	154	140	129	112	100
	275'	160	146	136	118	105
	300'	164	152	140	123	110
	325'	168	156	145	128	115
	350'	172	160	148	132	120
	375'	174	163	153	136	123
	400'	175	166	157	140	127

MULTIPLE USE DEPTH CHART





A SHORTCUT METHOD OF DETERMINING REASONABLENESS OF ASKING PRICES ON TODAY'S MARKET

The salesman, the appraiser and the mortgage lender are all interested in determining whether an asking or a selling price on today's market is reasonable.

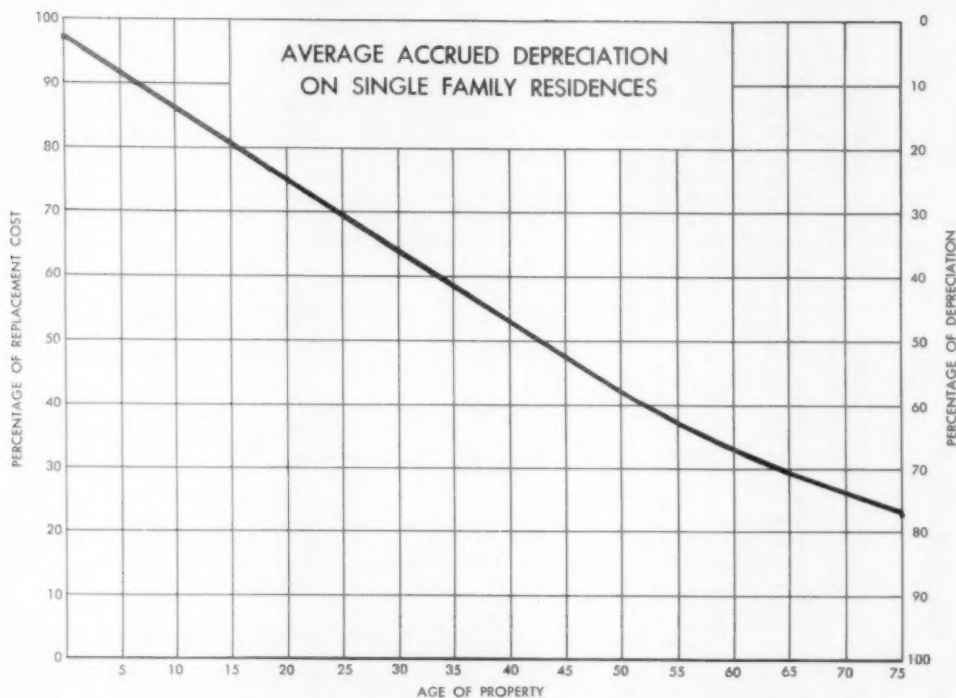
Frequently, real estate salesmen are loaded down with listings which have been taken at prices out of line with the market. Money is wasted on advertising and sales effort. In the end it may result in an offer so far below the listing price that the owner, who has been encouraged to believe that the listing price he gave was reasonable, either withdraws from the market or clings to his previous ideas of value until he becomes finally convinced that the market will not bring the price at which the real estate man accepted the listing.

The appraiser is quite frequently limited in a particular neighborhood by the lack of recent "comparable" sales. The few sales that may have taken place are generally of properties which are dissimilar in architectural design, size and location, and it becomes quite difficult to estimate the probable value of the particular property from the sales of a few others which are totally dissimilar.

The mortgage lender is always thinking of the soundness of his investment. If the property is overvalued in a rising market, the results may not be serious, but if a property is overvalued after the market has turned and is starting down, the value of the property may not stay ahead of the mortgage loan.

The table on the next two pages shows the average relationship of present selling prices of single-family residences to their selling prices in any period since 1908. The figures in this table are based on properties which are well maintained in neighborhoods which have had no change in use or deterioration through the infiltration of different racial or economic groups.

In order to use this table it is necessary that the selling price of the property in question be known at some time in the past, or that the selling price of a nearly identical property in the neighborhood be known for some time in the past. It can only be used on properties where no major alterations have been made since the



last sale of the property. It assumes, however, that good maintenance has taken place and that the property is relatively in as good condition as it was at the time of the previous sale. It also assumes that the last known sale of the property took place at the average of the market. If the sale at that time was at a price below the market, the present sales price arrived at by this method will also be below the market by about the same percentage. If, because of peculiar circumstances, the last sale of this property took place at a better price than the average, then the price arrived at by the use of this table will be above the market by about the same percentage.

The selling price arrived at from the table can be checked against the chart above if the replacement cost new of the entire property is available. By entire property is meant the replacement cost of the building, the land, driveways, and walks, planting, etc. On the average at the present time a single-family residence will sell for the percentage of its replacement cost new shown on this chart.

Of course, it is realized that in many cases neither the table nor the chart will take the place of the judgment of an appraiser, but, on the other hand, if the table and the chart give a somewhat similar value, and this value is also in agreement with the judgment of the individual examining the property, his judgment is confirmed by the average sales experience and the average depreciation allowances.

MARKET PRICE CALCULATOR

THE table below can be used to find the average selling price of a single-family residence which has been well maintained, if a previous selling price is known. It assumes, however, that the previous selling price was a fair price at the time. Suppose, for instance, that a residence sold in April 1920 for \$10,000 and that this was a fair price for the property at the time. The property has been well maintained and has been kept up to date by the usual modernization

in plumbing in the bathroom and kitchen but no major additions have been made in the intervening period. By referring to the table you will find that the index for April 1920 is 2.65. It is merely necessary to multiply the selling price at that time by this index in order to find the average selling price today. Since \$10,000 x 2.65 = \$26,500, if this property has varied as the general market has varied, it should sell today for \$26,500, or, let us say, roughly between \$26,000 and \$27,000.

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1908	-	-	-	-	-	3.31	-	-	-	-	-	-
1909	-	-	-	-	-	3.09	-	-	-	-	-	-
1910	-	-	-	-	-	3.09	-	-	-	-	-	-
1911	-	-	-	-	-	3.00	-	-	-	-	-	-
1912	-	-	-	-	-	2.99	-	-	-	-	-	-
1913	-	-	-	-	-	3.09	-	-	-	-	-	-
1914	-	-	-	-	-	3.86	-	-	-	-	-	-
1915	-	-	-	-	-	3.20	-	-	-	-	-	-
1916	-	-	-	-	-	3.19	-	-	-	-	-	-
1917	-	-	-	-	-	3.43	-	-	-	-	-	-
1918	-	-	-	-	-	3.63	-	-	-	-	-	-
1919	3.42	3.38	3.37	3.30	3.28	3.25	3.22	3.20	3.19	3.12	3.07	2.99
1920	2.83	2.72	2.65	2.65	2.70	2.72	2.75	2.70	2.65	2.60	2.51	2.38
1921	2.25	2.16	2.07	2.07	2.06	2.05	2.04	2.05	2.07	2.07	2.08	2.08
1922	2.08	2.08	2.10	2.11	2.12	2.13	2.14	2.11	2.09	2.07	2.05	2.03
1923	2.01	2.00	1.97	1.95	1.95	1.95	1.95	1.95	1.95	1.94	1.93	1.92
1924	1.92	1.91	1.89	1.88	1.87	1.84	1.81	1.81	1.80	1.79	1.78	1.78
1925	1.77	1.76	1.76	1.76	1.75	1.74	1.74	1.72	1.71	1.71	1.70	1.70

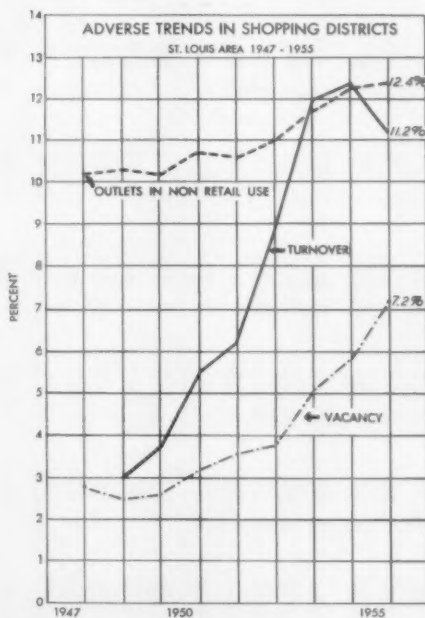
1926	1.71	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.74	1.75	1.76	1.76
1927	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.74	1.74	1.74	1.74
1928	1.74	1.74	1.75	1.74	1.74	1.74	1.73	1.73	1.72	1.72	1.71	1.70	1.69
1929	1.68	1.68	1.68	1.68	1.69	1.69	1.70	1.72	1.73	1.74	1.76	1.77	1.79
1930	1.81	1.83	1.85	1.87	1.88	1.89	1.89	1.90	1.91	1.93	1.95	1.98	1.99
1931	2.02	2.04	2.05	2.08	2.11	2.15	2.21	2.21	2.31	2.45	2.60	2.72	2.90
1932	3.05	3.21	3.40	3.55	3.60	3.60	3.56	3.56	3.51	3.46	3.42	3.38	3.33
1933	3.25	3.21	3.17	3.12	3.09	3.21	2.99	2.99	2.95	2.92	2.90	2.87	2.85
1934	2.83	2.80	2.78	2.77	2.77	2.77	2.77	2.77	2.77	2.77	2.76	2.75	2.78
1935	2.82	2.90	2.98	3.05	3.11	3.15	3.15	3.15	3.13	3.11	3.10	3.04	3.00
1936	2.98	2.95	2.92	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.90
1937	2.90	2.90	2.91	2.97	3.00	3.04	3.09	3.09	3.02	2.95	2.87	2.80	2.65
1938	2.50	2.40	2.28	2.22	2.23	2.38	2.44	2.44	2.58	2.67	2.74	2.78	2.81
1939	2.82	2.83	2.84	2.86	2.87	2.88	2.90	2.90	2.90	2.90	2.90	2.90	2.90
1940	2.90	2.91	2.94	3.00	3.02	3.05	3.09	3.09	3.09	3.09	3.09	3.09	3.09
1941	3.09	3.09	3.09	3.09	3.09	3.09	3.09	2.99	2.81	2.81	2.72	2.72	2.65
1942	2.72	2.65	2.65	2.65	2.65	2.58	2.58	2.58	2.50	2.50	2.50	2.50	2.58
1943	2.58	2.58	2.58	2.58	2.50	2.50	2.44	2.44	2.44	2.44	2.44	2.44	2.44
1944	2.32	2.32	2.21	2.16	2.21	2.16	2.16	2.15	2.14	2.13	2.10	2.09	2.05
1945	2.02	1.99	1.98	1.95	1.91	1.87	1.85	1.85	1.82	1.77	1.73	1.69	1.65
1946	1.59	1.55	1.50	1.46	1.44	1.41	1.38	1.38	1.35	1.34	1.33	1.32	1.32
1947	1.32	1.32	1.33	1.32	1.31	1.31	1.31	1.31	1.31	1.29	1.29	1.27	1.26
1948	1.25	1.23	1.23	1.22	1.22	1.21	1.20	1.20	1.20	1.19	1.19	1.20	1.20
1949	1.21	1.21	1.20	1.20	1.21	1.21	1.21	1.21	1.21	1.22	1.22	1.21	1.21
1950	1.21	1.20	1.20	1.20	1.18	1.17	1.16	1.16	1.15	1.15	1.14	1.13	1.11
1951	1.10	1.09	1.09	1.08	1.07	1.07	1.06	1.06	1.06	1.05	1.05	1.04	1.04
1952	1.04	1.04	1.03	1.03	1.03	1.04	1.04	1.04	1.04	1.03	1.04	1.04	1.04
1953	1.05	1.04	1.04	1.05	1.05	1.04	1.04	1.04	1.04	1.04	1.04	1.03	1.03
1954	1.03	1.02	1.02	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.01	1.00
1955	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

ADVERSE TRENDS IN OLDER SHOPPING DISTRICTS

FOR the past several years, many neighborhood shopping districts in the St. Louis area have been developing symptoms of their approaching infirmity. The foremost symptom and at the same time the most disastrous effect of this infirmity is vacancy. Another unhealthy symptom is high turnover, and a third one is "increasing percentage of nonretail use."

These remarks and those to follow are based on an annual survey made by Roy Wenzlick & Co. in the Greater St. Louis area, and deal only with older neighborhood shopping districts - mostly string street or ribbon developments. The survey is made by driving slowly through each of the shopping districts and noting the name and type of use at each address. The results are then tabulated and compared with the results of previous surveys. The 50 districts covered by the survey are scattered through the city and suburbs of St. Louis, and range in size from 35 to 265 stores (or uses, because an increasing number are not stores). Street frontage in these districts ranges between 1,800 feet and 9,000 feet.

As you can see from the chart opposite, adverse trends are continuing to increase in these districts. Perhaps the most disturbing is the rising vacancy rate, which has climbed to 7.2% in 1955 from 2.7% in 1947. Another adverse trend, perhaps foreshadowing a continued decline of these districts, is the increasing percentage of "nonretail use." This figure has risen from 10.1% in 1947 to 12.4% in 1955. Percentage of turnover is a fairly good indicator of the stability of a district, and this indicator is a good deal higher than it was in the early post-war period. Its present high level of 11.2% during the 1954-1955 period suggests that these districts are becoming more unstable than they were in 1947-1948, when the turnover percentage was only 3.0%.



One analysis of the vacancy percentages reveals about what you would expect. All of the 15 districts with the greatest vacancy rates (7.9% to 15.0%) are located within the highly urbanized areas of Greater St. Louis. Furthermore, of the 12 suburban districts covered by the survey, 11 had a lower than average (less than 7.2%) vacancy rate.

Insofar as growth of the districts since 1947 is concerned, most of it has naturally taken place in the suburbs. Of the 10 districts with the greatest growth (12% to 39%) 7 are located in the suburbs. Moreover, one of the rapidly growing urban districts has a 12% vacancy rate, indicating that expansion may have been overdone. Conversely, the districts that have shrunk the most are the urban districts. Among the 15 districts that have shrunk (from 0.5% to 22.5%), 14 are in urban areas. The biggest decrease was caused partly by demolition of buildings for a new expressway. In this district only, however, was the demolition of buildings a factor.

Before going on to a more detailed analysis, let's take one final look at the three disturbing factors.

Vacancy. In 1947, vacancy amounted to 152 units out of a total of 5,602 (2.7%). In 1955, it amounted to 421 units out of a total of 5,823 (7.2%). Thus, while the number of units has increased about 4%, the number of vacancies has increased 177%.

Turnover. From 1947 to 1948 there were 170 new uses out of 5,602 total, or a 3% turnover. From 1954 to 1955, there were 655 new uses out of 5,823, or a turnover of 11.2%.

Nonretail use. In 1947, there were 564 outlets devoted to offices, storage, industrial, residences and churches in stores, and other nonretail uses. This amounted to 10.1% of the 5,602 outlets. In 1955, this figure had risen to 720 non-retail uses out of 5,823 outlets, or 12.4%. During this 8-year period, the number of realty-loan-insurance offices increased 41%, doctor and dentist offices increased 40%, storage increased 50%, as did industrial uses, and churches in stores. Despite the decreasing housing shortage, there has been an increase of 126% since 1947 in the number of residences in stores.

Change of use within the shopping districts has also reflected some well-known trends. For example, the number of food stores has been in a steady decline in these older districts, and is now 24% below the 1947 figure. This is accounted for by the new shopping districts, all of which contain at least one supermarket, and the tendency of supermarkets to locate in more isolated spots where plenty of parking is available. The following tabulation shows what changes have taken place in these older districts.

PERCENTAGE OF NET CHANGE BY GROUPS
1947-52, 1952-53, 1953-54, 1954-55, 1947-55
(Summary of 50 Shopping Centers)

	1947-52	1952-53	1953-54	1954-55	1947-55
Food group	-11.6	-5.6	-4.3	-5.0	-24.0
General merchandise group	+4.2	-1.5	-1.5	+3.1	+3.2
Apparel group	+5.2	-1.7	-4.0	-5.6	-8.5
Furniture-household group	+2.5	-1.2	*	-2.5	-1.0
Eating-drinking group	+5.5	-0.6	-1.5	-2.5	+0.8
Automotive group	-1.0	-4.5	+0.8	-2.6	-7.1
Lumber-building group	+15.5	-7.6	+6.3	-7.2	+5.4
All other retail group	+0.1	+0.3	-1.6	+2.4	+1.1
Service group	-1.6	-1.8	-0.4	+2.3	-1.7
Recreation group	-6.4	-4.1	-11.4	+8.0	-14.0
Office group	+9.1	+7.8	+1.3	+1.1	+20.2
Noncommercial group	+23.9	+2.6	+26.5	+2.7	+65.0
Vacant, for rent, others	+42.8	+32.6	+16.7	+22.7	+177.0

*No change.

You will notice that over the 8-year period nearly all shopper types of use have decreased. General merchandise and the lumber-building group have shown slight increases, but all other shopper types of outlet and the service and recreation groups have decreased. Furthermore, you will notice that during 1954-1955 the lumber-building group decreased in number by 7.2%.

Within the individual groups of stores there have been even wider percentage changes during the 1947-1955 period. The table on the following page shows the more significant of these changes. About the only explanation we can offer for a decrease in the number of fur shops in these older districts is that the families that usually wear furs are moving into the suburbs and are now patronizing the fur shops located in the newer shopping centers. Insofar as hat shops are concerned, they usually require a high volume of traffic, and a good many of them have moved to the newer centers. Liquor stores are probably diminishing because of the tendency for supermarkets and drug stores to carry large supplies of liquor at cut-rate prices. The decreases in the other types of stores are for similar reasons. Nearly all types of shoppers' goods outlets are decreasing in these older districts because they are being hurt by the competition of the new shopping centers. We have pointed out many times that the new centers were going to compete most vigorously at first with the old string street developments. Later on, when the older districts have been closed down, the new centers will start competing more vigorously with each other.

Now notice the types of uses that have shown the biggest increases. Of course, it's obvious why laundromats have increased so much. There were relatively few of them in 1947 and a comparatively small numerical increase resulted in a large percentage increase. That stores selling floor coverings and drapes have

increased shows that the do-it-yourself trend is not confined to the suburbs. However, this is hardly shopper-type merchandise. Music stores have increased in these older districts for two main reasons. First of all, more kids are taking music lessons and more kids are buying records. Moreover, there has been an enormous increase in the production of records and record players. Secondly, the number of music stores was at a low ebb following the war, and this increase probably brings them back to about where they should normally be.

PERCENTAGE OF NET CHANGE IN USES, 1947-55
(By Type of Business)

Decreases		Increases	
Fur shops	-55.0%	Laundromats	+82.0%
Hat shops	-47.1	Floor coverings, drapes .	+79.2
Groceries	-41.5	Music stores	+52.5
Liquor stores	-30.5	Industrial	+50.0
Confectioneries	-22.7	Storage	+50.0
Delicatessens	-13.6	Realty, law, insurance off.	+41.0
Filling stations	-13.5	Doctors, dentists	+40.0
Shoe repair	-12.0	Shoe stores	+12.6
Beauty shops	-9.1	Taverns and bars	+10.7

Of all types of uses that have shown substantial increases in the number of outlets during the 1947-55 period, only shoe stores sell what is considered shopper-type merchandise. The other increases have come in outlets that sell merchandise purchased at infrequent intervals, or in service outlets, or in outlets that are nonretail in character.

The same trends that affect these older districts in the St. Louis area are undoubtedly at work in other large cities, and for the same reasons. These districts grew up many years ago along public transportation lines and clustered around transfer points. The increasing congestion, caused by more people and more automobiles, frequently concentrates in these districts, making automobile shopping difficult, if not unpleasant.

Most of these districts will never regain their former importance. Some of them, however, hold such possibilities that through rezoning and redevelopment they can be brought to a point where their importance and utility will last for many years. As a matter of fact, rezoning and redevelopment would improve them all, but in some cases the surrounding neighborhoods have deteriorated to such an extent that simply cleaning up the shopping district would not be enough.

It is relatively easy to guess the future of some of these old districts. The strong ones will go downhill for a few more years and will then be rehabilitated. The weak ones will slowly die and will be replaced by some other use. Those that are neither strong nor weak cannot be analyzed so generally, but the chances are that they will continue to go downhill until they become much smaller.

ESTIMATING BUILDING CONTENT

Because they recognized the importance of a standardized system of building measurement, the FHA and the American Institute of Architects long ago issued definitions and specifications as to how this should be done. Without going into the details of these two measuring specifications, we can point out their most important parts.

In cubing a building, you should include all space enclosed within the outer surfaces of the outside walls, the outside surface of the roof, and 6 inches below the finished surface of the lowest floor. This, naturally, includes all dormers, gables, penthouses, bays, and other enclosed portions of the building. It does not include cornices, outside steps, courts, light shafts, open porches, or loggias.

The best practice to follow in measuring any building is to walk completely around it first. Once you have an idea of its size and shape, go around again, measuring and sketching in the drawing as you go. It is a good idea to measure the entire building, and to check your dimensions by adding up all of the measurements along the east side to see if they total the same as the dimensions on the west side. Do the same to the dimensions on the north and south sides

In measuring ceiling heights you'll find it helpful to know how far it is from your chin to the floor. Once you know this, all you ever have to do is measure from the ceiling down to your chin and then add the distance from your chin to the floor. If you're 6 feet tall, you'll measure about 5 feet 4 inches to 5 feet 5 inches from the floor to your chin.

In choosing between the square foot and the cubic foot methods of estimating replacement cost, we recommend the cubic foot method in most cases. We use it almost exclusively. It takes a little longer, but greater accuracy is possible than in using the square foot method. This is especially true when residential buildings are involved. There are so many story height variations and differences in basements and roof structures that we find the square foot method inadequate. As a matter of fact, even greater accuracy can be obtained by finding the cubic content of the basement space, living space, and attic space, and applying different cubic cost figures to each.

Square foot costs may be used with satisfactory accuracy in estimating replacement costs on one-story commercial and industrial buildings. Upon occasion you will also find them satisfactory in estimating the cost of small and simple single-family residences.

The cubic contents of the basements of the houses shown in these diagrams are all figured the same - area of the basement multiplied by the basement height; therefore, the basements have been left out of the diagrams.

BASIC SHAPES OF RESIDENTIAL BUILDINGS

I



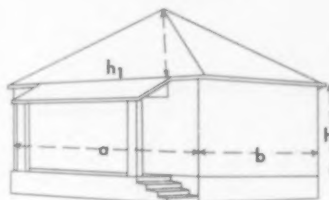
Volume = base x height

Base = $a \times b$

Height = h

Volume = $a \times b \times h$

II



Volume = base x height of 1st story + pyramid-shaped roof

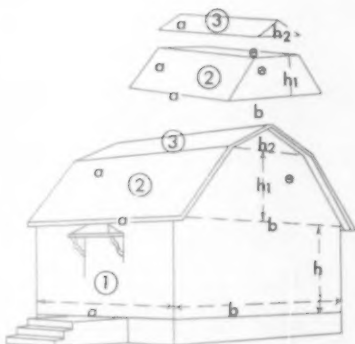
Base = $a \times b$

Height of 1st story = h

Height of roof = h_1 (perpendicular distance from peak to ceiling joists)

$V = a \times b \times h + a \times b \times \frac{h_1}{3}$

III



Volume = $1 + 2 + 3$

Volume of 1 = $a \times b \times h$

Volume of 2 = $\left(\frac{e+b}{2}\right) \times h_1 \times a$

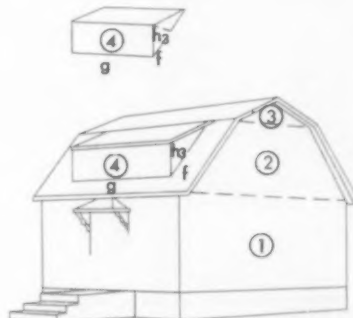
Volume of 3 = $a \times e \times \frac{h_2}{2}$

e = length across gable at roof angle

h_2 = height of triangular portion of gable

h_1 = height of trapezoidal portion of gable

IV



Volume = $1 + 2 + 3 + 4$

Volume of 1 + 2 + 3 same as diagram III

Volume of 4 = $f \times \frac{h_3}{2} \times g$

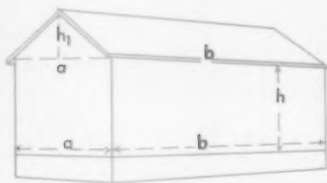
g = length of dormer

f = length of base of triangular end

h_3 = perpendicular height of triangular end

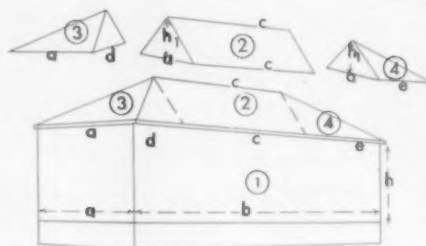
BASIC SHAPES OF RESIDENTIAL BUILDINGS

V



$$\text{Volume} = a \times b \times h + a \times b \times \frac{h_1}{2}$$

VI



$$\text{Volume} = 1 + 2 + 3 + 4$$

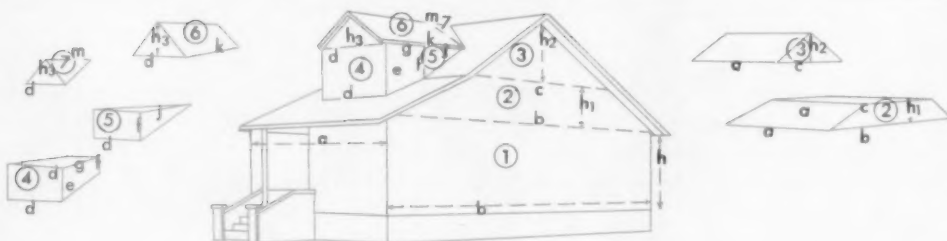
$$\text{Volume of 1} = a \times b \times h$$

$$\text{Volume of 2} = a \times c \times \frac{h_1}{2}$$

$$\text{Volume of 3} = a \times d \times \frac{h_1}{3}$$

$$\text{Volume of 4} = a \times e \times \frac{h_1}{3}$$

VII



$$\text{Volume} = 1 + 2 + 3 + 4 + 5 + 6 + 7$$

$$\text{Volume of 1} = a \times b \text{ (- porch area)} \times h$$

$$\text{Volume of 2} = \frac{c+b}{2} \times h_1 \times a$$

$$\text{Volume of 3} = a \times c \times \frac{h_2}{2}$$

$$\text{Volume of 4} = \frac{e+f}{2} \times g \times d$$

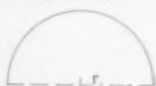
$$\text{Volume of 5} = d \times f \times \frac{j}{2}$$

$$\text{Volume of 6} = d \times k \times \frac{h_3}{2} \quad (k = g + j)$$

$$\text{Volume of 7} = d \times \frac{h_3}{2} \times \frac{m}{3}$$

MISCELLANEOUS SHAPES FOUND LESS FREQUENTLY

HEMISPHERE (DOME)



$$V = \frac{2\pi r^3}{3}$$

$$r = \text{radius}$$

$$\pi = 3.1416 \text{ or } 22/7$$

CONE



$$V = B \times \frac{a}{3}$$

$$B = \pi r^2$$

$$r = \text{radius}$$

$$a = \text{altitude}$$

$$\pi = 3.1416 \text{ or } 22/7$$

CYLINDER

$$V = B \times a$$

$$B = \pi r^2$$

$$r = \text{radius}$$

$$a = \text{altitude}$$

$$\pi = 3.1416 \text{ or } 22/7$$



